

THE AFRICAN ETHNOLOGIST

Vol.

NUMBER 3

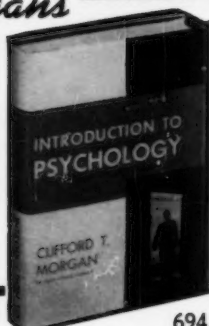
June, 1958

Monthly by

ETHNOLOGICAL ASSOCIATION, INC.

A Widely Adopted Leader!

Morgan's



INTRODUCTION TO PSYCHOLOGY

694 pages
\$6.50

CLIFFORD T. MORGAN
The Johns Hopkins University

Something NEW . . . Something DIFFERENT . . .

This unique text presents the principles and applications of modern psychology in readable and interesting form. It is intended for the first college course in psychology, ordinarily taken by freshmen and sophomores. Comprehensive in coverage, it is also suitable both for the terminal course and for the course prerequisite to other psychology courses. It presents a broad perspective of psychology, including both its physiological and social aspects.

*Thoroughly up to date and abreast of developments
in the different areas of psychology.*

- This outstanding book is more practical in approach, less discursive, much easier to understand, and more applicable to everyday problems.
- It is the only text to include an effective "summary" and a Glossary.
- In addition it contains chapters not usually found in such books:

Prejudice and Social Conflict	Internal Environment
Work and Efficiency	Animal Behavior
Language and Speech	Techniques of Study
- There is an abundance of excellent illustrations.

It is a most carefully illustrated and "packaged" introductory book. The illustrations have been specially prepared, and the format is a striking two-column one.
- **OUTSTANDING TEACHING AIDS**

A Student Workbook—a valuable student aid correlated with the text (\$1.50).
A Teacher's Manual—contains objective examination questions and lists of films. **FREE** to teachers using the book.

It is less technical, more interesting, and covers a wider range of subject matter.

— SEND FOR A COPY ON APPROVAL —

McGRAW-HILL BOOK COMPANY, INC.

330 West 42nd Street

New York 36, N. Y.

THE AMERICAN PSYCHOLOGIST

Journal of the American Psychological Association, Inc.

Volume 13

March, 1958

Number 3

In this Issue

APA Symposium: Control of Behavior Through Motivation and Reward	93
Introductory Remarks. HAROLD SCHLOSBERG	93
Reinforcement Today. B. F. SKINNER	94
Central Stimulation and Other New Approaches to Motivation and Re- ward. NEAL E. MILLER	100
The Motivating Effects of Exteroceptive Stimulation. D. O. HEBB	109
Applicants for Fellow Status: 1959	114
Comment	116
Psychology in Action	120
Psychology in the News	123
Psychology in the States	124
Psychological Notes and News	126
Convention Calendar	130

ROGER W. RUSSELL, Editor

Advisory Editors: STUART W. COOK, ANN MAGARET GARNER, NEAL E. MILLER

ARTHUR C. HOFFMAN, Managing Editor

HELEN ORR, Circulation Manager

THE AMERICAN PSYCHOLOGIST is published monthly at Prince and Lemon Streets, Lancaster, Pennsylvania. Subscription: \$8.00, single copy: \$1.00. Communications on editorial and business matters and advertising should be addressed to the American Psychological Association, Inc., 1333 Sixteenth Street N.W., Washington 6, D. C. Address changes must reach the Subscription Office by the 10th of the month to take effect the following month. Undelivered copies resulting from address changes will not be replaced; subscribers should notify the post office that they will guarantee second-class forwarding postage. Other claims for undelivered copies must be made within four months of publication.

Entered as second-class matter January 12, 1950 at the Post Office at Lancaster, Pa., under the Act of March 3rd, 1879. Acceptance for mailing at special rate of postage provided for in paragraph (d-2), section 34.40, P. L. and R. of 1948, authorized August 6, 1947.

Copyright © 1958 by the American Psychological Association, Inc.

Officers of the American Psychological Association

President

HARRY F. HARLOW
University of Wisconsin
Madison, Wisconsin

President-elect

WOLFGANG KÖHLER
Swarthmore College
Swarthmore, Pennsylvania

Past President

LEE J. CRONBACH
University of Illinois
Urbana, Illinois

Recording Secretary

LAUNOR F. CARTER
System Development Corporation
Santa Monica, California

Treasurer

MEREDITH P. CRAWFORD
Human Resources Research Office
Washington 6, D. C.

Executive Secretary

ROGER W. RUSSELL
1333 Sixteenth Street N.W.
Washington 6, D. C.

Board of Directors

The President, the President-elect, the Past President, the Recording Secretary, the Treasurer, the Executive Secretary, and DOROTHY C. ADKINS, ANNE ANASTASI, HAROLD M. HILDRETH, NEAL E. MILLER, GARDNER MURPHY, and ROBERT L. THORNDIKE.

The American Psychological Association, founded in 1892 and incorporated in 1925, is the major psychological organization in the United States. The purpose of the APA is to advance psychology as a science, as a profession, and as a means of promoting human welfare. It attempts to further these objectives by holding annual meetings, publishing psychological journals, and working toward improved standards for psychological training and service.

In addition to journals, the APA publishes a monthly *Employment Bulletin* and an annual *biographical Directory*.

All general communications, inquiries concerning membership, letters concerning dues, subscriptions, and changes of address should be directed to:

American Psychological Association, Inc.
1333 Sixteenth Street N.W.
Washington 6, D. C.

Publications of the American Psychological Association

American Psychologist. Editor: ROGER W. RUSSELL, American Psychological Association. Official papers of the association and articles on psychology. Monthly. Subscription: \$8.00 (Foreign \$8.50). Single copies, \$1.00.

Contemporary Psychology. Editor: EDWIN G. BORING, Harvard University. Critical reviews of books, films, and other material in the field of psychology. Monthly. Subscription: \$8.00 (Foreign \$8.00). Single copies, \$1.00.

Journal of Abnormal and Social Psychology. Editor: M. BREWSTER SMITH, New York University. Original contributions in the field of abnormal and social psychology, and case reports. Bimonthly, two volumes per year. Subscription: \$16.00 for 2 vols. (Foreign \$16.50). Single copies, \$3.00.

Journal of Applied Psychology. Editor: JOHN G. DARLEY, University of Minnesota. Applications of psychology to business and industry. Bimonthly. Subscription: \$8.00 (Foreign \$8.50). Single copies, \$1.50.

Journal of Comparative and Physiological Psychology. Editor: HARRY F. HARLOW, University of Wisconsin. Original contributions in the field of comparative and physiological psychology. Bimonthly. Subscription: \$8.00 (Foreign \$8.50). Single copies, \$1.50.

Journal of Consulting Psychology. Editor: LAURANCE F. SHAFFER, Teachers College, Columbia University. Research in clinical psychology: psychological diagnosis, psychotherapy, personality, and psychopathology. Bimonthly. Subscription: \$8.00 (Foreign \$8.50). Single copies, \$1.50.

Journal of Educational Psychology. Editor: RAYMOND G. KUHNEN, Syracuse University. Studies of learning and teaching. Bimonthly. Subscription: \$8.00 (Foreign, \$8.50). Single copies, \$1.50.

Journal of Experimental Psychology. Editor: ARTHUR W. MELTON, University of Michigan. Original contributions of an experimental character. Monthly, two volumes per year. Subscription: \$16.00 for 2 vols. (Foreign \$16.50). Single copies, \$1.50.

Psychological Abstracts. Executive Editor: ALLEN J. SPROW, American Psychological Association. Noncritical abstracts of the world's literature in psychology and related subjects. Bimonthly. Subscription: \$16.00 (Foreign \$16.50). Single copies, \$3.00.

Psychological Bulletin. Editor: WAYNE DENNIS, Brooklyn College. Evaluative reviews of research literature, and articles on research methodology in psychology. Bimonthly. Subscription: \$8.00 (Foreign \$8.50). Single copies, \$1.50.

Psychological Monographs: General and Applied. Editor: NORMAN L. MUNN, Bowdoin College. Longer researches and laboratory studies which appear as units. Published at irregular intervals. Subscription: \$8.00 per volume (Foreign, \$8.50). Single copies, price varies according to size.

Psychological Review. Editor: THEODORE M. NEWCOMB, University of Michigan. Original contributions of a theoretical nature. Bimonthly. Subscription: \$8.00 (Foreign \$8.50). Single copies, \$1.50.

APA SYMPOSIUM CONTROL OF BEHAVIOR THROUGH MOTIVATION AND REWARD¹

INTRODUCTORY REMARKS

HAROLD SCHLOSBERG

Brown University

SOME time ago, the Chairman of the APA Convention Program Committee asked me to arrange a symposium that would present to the general membership some aspects of the current developments in one or more of the academic divisions. This was to be the first of a series that would eventually include the other divisions of the APA. Before I accepted the responsibility, I discussed the possible topics and speakers with my local associates over lunch. We all felt that the symposium should focus on a single area, rather than attempt to present two or three chapters of the *Annual Reviews of Psychology*. Once this was decided, the obvious choice was Learning, for this area is of central importance to all psychologists. Further, there are some promising signs of real progress in this area, after a decade or two of the doldrums. Finally, we reached rapid agreement on the characteristics of the speakers: they should have firsthand knowledge of the new developments in Learning, and they should also represent the major systematic approaches to Learning. Once these characteristics had been fed into the ILC (informal luncheon conference), it produced three names:

1. Fred Skinner, who denies any theoretical slant, although he has no hesitancy in applying the general principles of reinforcement he has worked out on rats and pigeons to such higher animals as man—and, I might add, if these principles are as effective on man as on pigeons, we may be in for a bloodless revolution!

2. Neal Miller, whose original position as a Drive

Reductionist may or may not be shifting as a result of his recent physiological studies.

3. Don Hebb, whose theoretical position might be characterized as a Centralist, although some of the remarkable work of his laboratory emphasizes the importance of peripheral stimulation.

In addition to their technical qualifications, these men are all noted for their willingness to come out of the ivory tower and for their ability to present good talks. As a token of these characteristics, I might point out that all three have been elected President of Division 3 as well as of the Eastern Psychological Association. And their final qualification is equally important: although all three are busy, I knew they had enough public spirit to agree to participate in the symposium, especially if it was kept informal enough so these old friends could kid each other a bit during and after the presentation!

After the ILC had delivered the names, my work was almost over. All three agreed to participate, and a little correspondence plus a luncheon at EPA apportioned the area among them. First, Fred Skinner will tell us about control of behavior through specific external stimulation. He will give special attention to the effects of various schedules of reinforcement, for it is this type of reinforcement that is most characteristic of the affairs of daily life. Then, Neal Miller will bring us up-to-date on the more physiological aspects of motivation and reward. We seem to be in the midst of a real breakthrough in this area. Finally, Don Hebb will take us outside the organism again, for he will discuss some of the implications of the recent research which shows the amazing importance of general environmental stimulation in developing and maintaining the behavior of the organism.

¹ This symposium was presented at the 1957 Annual Convention of the APA in New York City on September 1, 1957.

REINFORCEMENT TODAY

B. F. SKINNER

Harvard University

DURING the past 25 years the role of reinforcement in human affairs has received steadily increasing attention—not through any changing fashion in learning theory but as the result of the discovery of facts and practices which have increased our power to predict and control behavior and in doing so have left no doubt of their reality and importance. The scope of reinforcement is still not fully grasped, even by those who have done most to demonstrate it, and elsewhere among psychologists cultural inertia is evident. This is understandable because the change has been little short of revolutionary: scarcely anything in traditional learning theory is left in recognizable form. In this paper I shall try to characterize some of the changes in our conception of reinforcement which have been forced upon us and to suggest why it has been so hard to accept them and to recognize their import.

THE ACQUISITION OF BEHAVIOR

In 1943 Keller Breland, Norman Guttman, and I were working on a wartime project sponsored by General Mills, Inc. Our laboratory was the top floor of a flour mill in Minneapolis, where we spent a good deal of time waiting for decisions to be made in Washington. All day long, around the mill, wheeled great flocks of pigeons. They were easily snared on the window sills and proved to be an irresistible supply of experimental subjects. We built a magnetic food-magazine, which dispensed grain on the principle of an automatic peanut vendor, and conditioned pigeons to turn at the sound it made and eat the grain it discharged into a cup. We used the device to condition several kinds of behavior. For example, we built a gauge to measure the force with which a pigeon pecked a horizontal block, and by differentially reinforcing harder pecks we built up such forceful blows that the base of the pigeon's beak quickly became inflamed. This was serious research, but we had our lighter moments. One day we decided to teach a pigeon to bowl. The pigeon was to send a wooden ball down a miniature alley toward a set of toy pins by swip-

ing the ball with a sharp sideward movement of the beak. To condition the response, we put the ball on the floor of an experimental box and prepared to operate the food-magazine as soon as the first swipe occurred. But nothing happened. Though we had all the time in the world, we grew tired of waiting. We decided to reinforce any response which had the slightest resemblance to a swipe—perhaps, at first, merely the behavior of looking at the ball—and then to select responses which more closely approximated the final form. The result amazed us. In a few minutes, the ball was caroming off the walls of the box as if the pigeon had been a champion squash player. The spectacle so impressed Keller Breland that he gave up a promising career in psychology and went into the commercial production of behavior.

Why had the pigeon learned with such surprising speed? Three points seem relevant:

1. In *magazine-training* the pigeon—that is, in getting it to respond to the sound of the magazine by turning immediately and approaching the food tray—we had created an auditory *conditioned reinforcer*. This is a great help in operant conditioning because it can follow a response instantly. When a rat runs down an alley and finds food at the end, or when a performing seal bounces a ball off its nose and is thrown a fish, behavior is reinforced under relatively loose temporal conditions. The rat may not immediately find the food, and the trainer may take a moment to throw the fish. Organisms will, of course, learn and continue to behave when reinforcement is substantially delayed, but only when certain temporal contingencies have been strengthened. Unless the gap between the behavior and the ultimate reinforcer is bridged with a sequence of conditioned reinforcers, other behavior will occur and receive the full force of the reinforcement. If the seal has time to turn toward the trainer before receiving the visual reinforcement of the approaching fish, its behavior in turning is most powerfully reinforced and may interfere with the behavior the trainer is trying to set up. Eventually a discrimination is formed so that the seal turns

only after having executed the proper behavior, but this can be a slow process. A delay of even a fraction of a second is sometimes important, as we have found in designing equipment for the study of operant behavior in the pigeon. When the response studied is pecking a plastic disc, the controlling circuit must act so rapidly that the sound of the magazine, as a conditioned reinforcer, will coincide with striking the disc rather than pulling the head away from it. This is a matter of perhaps a twentieth of a second, but such a delay produces disturbing changes in the topography of the response.

2. In early experiments on lever pressing, a quick response to the food-magazine was always set up before the lever was introduced. This was done for another reason—to permit emotional responses to the noise of the magazine to adapt out—but it must have been important in providing instantaneous reinforcement. The explicit conditioning of an auditory reinforcer was, therefore, not new; there must have been something else in the bowling experiment. In most experiments on learning an organism produces reinforcement by direct action: a rat pushes over the door of a jumping stand and discovers food, or a monkey lifts a cup and exposes a grape. Electrical circuits greatly increase the possibilities, but even then the organism is usually left to close the circuit by mechanical contact. I have elsewhere (3) described an experiment in which a rat was conditioned to pull a string to get a marble from a rack, pick up the marble with its forepaws, carry it across the cage to a vertical tube rising two inches above the floor, lift the marble, and drop it into the tube. The behavior was set up through successive approximations, but every stage was reached by constructing mechanical and electrical systems operated by the rat. In the experiment on bowling, however, we held the reinforcing switch in our hand and could reinforce any given form of behavior without constructing a mechanical or electrical system to report its occurrence. *The mechanical connection between behavior and reinforcement was greatly attenuated.*

3. But this was not new, either. Thorndike had reinforced a cat when it licked its paw, and animal trainers use hand reinforcement. The surprising result in our bowling experiment may have been due to the combination of the temporal precision of reinforcement provided by a conditioned reinforcer and the free selection of topography result-

ing from hand reinforcement. In any event this combination must have enhanced the effect of the third, and main, feature of the experiment: the gradual *shaping up* of behavior by reinforcing crude approximations of the final topography instead of waiting for the complete response.

The technique of shaping behavior is now a familiar classroom demonstration, but the principle it demonstrates has not yet found a secure place in textbook discussions of learning. Curiously enough, the acquisition of behavior has never been directly attacked in classical research. The study of memory, from Ebbinghaus on, has not been primarily concerned with how behavior is acquired but only with how it is retained or how one form interferes with another in retention. Why does the subject sit in front of the memory drum, why does he vouchsafe anticipatory guesses, and how (not when) does he eventually arrive at that first correct response? These questions have not been the primary concern of research on memory. Animal research has almost always left the shaping of behavior to mechanical devices. In both fields the acquisition of behavior has been reported by "learning curves" or, worse, by something called *the* learning curve. When one has watched the actual shaping of behavior, it is obvious that such curves do not reflect any important property of the change in behavior brought about by operant reinforcement. They summarize the arbitrary and often accidental consequences which arise when complex and largely unanalyzed conditions of reinforcement act upon large samples of behavior. There are probably as many learning curves as there are apparatuses for the study of learning, and mathematicians will strive in vain to pull a useful order out of this chaos. Yet the prestige of the learning curve is so great that psychologists are unable to believe their eyes when the process of learning is made visible.

THE MAINTENANCE OF BEHAVIOR

An obvious fact about behavior is that it is almost never invariably reinforced. Not so obvious is the fact that the pattern of intermittent reinforcement controls the character and level of a performance. Why this is so can not be explained in a few words. Charles B. Ferster and I have recently published a fairly exhaustive account of the subject (1) in which we argue as follows.

A schedule of reinforcement is arranged by a

programming system which can be specified in physical terms. A clock is introduced into the circuit between key and magazine so that the first response made to the key after a given interval of time will be reinforced. A counter introduced into the circuit establishes a contingency in terms of number of responses emitted per reinforcement. Various settings of clock and counter and combinations of these generate almost unlimited possibilities.

A selected schedule usually generates a characteristic performance, expressed in terms of rate of responding and changes in rate. Once this has happened, the organism is characteristically reinforced at the end of a particular pattern of responding. Its behavior at the moment of reinforcement and during the period preceding reinforcement is part of the stimulating environment, aspects of which acquire control over subsequent behavior. To take a very simple example: if an organism is characteristically responding at a high rate at the moment of reinforcement, behavior at that rate becomes an optimal stimulating condition, comparable to the presence of the reinforced stimulus in a discrimination, and the probability of further responding is therefore maximal. When the organism is not responding at all, the probability is minimal. Other rates and patterns of changes in rate come to serve similar discriminative functions. Ferster and I have checked this explanation of the performances characteristic of schedules in several ways. For example, instead of letting a schedule generate a condition *most* of the time, we have added special devices to *assure* a given condition of behavior at every reinforcement. For example, when a fixed-interval performance *usually* arranges a moderately high rate at the moment of reinforcement, a special device will guarantee that reinforcements occur *only* at that rate. We have also added stimuli to the physical environment which are correlated with, and hence amplify, the aspects of the organism's behavior appealed to in such an explanation.

This, then, is what happens under intermittent reinforcement: A scheduling system sets up a performance, and the performance generates stimuli which enter into the control of the rate of responding, either maintaining the performance or changing it in various ways. Some schedules produce performances which guarantee reinforcement under conditions which continue to maintain that per-

formance. Others produce progressive changes. Still others yield oscillations: the first performance generates conditions which eventually produce a different performance, which in turn generates conditions restoring the earlier performance, and so on.

Both the circuit and the behavior, then, contribute to the reinforcing contingencies. It follows that the effect of any circuit depends upon the behavior the organism brings to it. Some complex schedules can be studied only by taking the organism through a series of simpler schedules into the final performance. The performance, as well as the topography of a response, may need to be "shaped." This does not mean that schedule-performances vary greatly because of individual histories, for only a few of the effects of schedules are not readily reversible. Once a performance is reached, it usually shows a high order of uniformity, even between species. The fact that it is the *combination* of schedule and performance which generates reinforcing contingencies can easily be overlooked. A physiologist once asked to borrow one of our apparatuses to show his class the behavioral effects of certain drugs. We sent him an apparatus which reinforced a pigeon on a multiple fixed-ratio fixed-interval schedule, together with two pigeons showing beautifully stable performances. When one pigeon died through an overdose of a drug, the physiologist simply bought another pigeon and put it into the apparatus. To his surprise, nothing happened.

The same mistake is made in much traditional work on learning and problem solving. In the usual study of problem solving, for example, the experimenter constructs a complex set of contingencies and simply waits for it to take hold. This is no test of whether the organism can adjust to these contingencies with a performance which would be called a solution. All we can properly conclude is that the experimenter has not constructed an adequate succession of performances. The ability of the experimenter rather than that of the organism is being tested. It is dangerous to assert that an organism of a given species or age *can not* solve a given problem. As the result of careful scheduling, pigeons, rats, and monkeys have done things during the past five years which members of their species have never done before. It is not that their forebears were incapable of such behavior; nature had simply never arranged effective sequences of schedules.

What we have learned about the shaping of response-topography and about the techniques which bring an organism under the control of complex schedules has made it possible to study the behavior generated by arrangements of responses, stimuli, and reinforcements once classified as the "higher mental processes." An experiment can be designed in which two or more responses are emitted concurrently or in rapid alternation, under the control of multiple stimuli, often under two or more schedules of reinforcement or two or more types of reinforcement under appropriate conditions of motivation. It has been found that a schedule, or rather the stimuli present when a schedule is in force, has reinforcing or aversive properties. An organism will respond on one schedule to reach or avoid another. We can determine which of two schedules a pigeon "prefers" by comparing how fast it will respond on a variable-interval schedule to get into Schedule A with how fast it will respond on the same variable-interval schedule to get into Schedule B. The analysis of avoidance and escape behavior in the hands of Sidman, Brady, and others has made it possible to study combinations of positive and negative reinforcers in many interrelated patterns. The analysis of punishment in such terms has permitted a reformulation of the so-called Freudian dynamisms (5).

The technology resulting from the study of reinforcement has been extended into other fields of psychological inquiry. It has permitted Blough, Guttman, and others to convert pigeons into sensitive psychophysical observers. It has allowed pharmacologists and psychologists in pharmacological laboratories to construct behavioral base lines against which the effects of drugs on the so-called higher mental processes can be evaluated. It has enabled Lindsley and his co-workers to test the limits of the environmental control of psychotic subjects. And so on, in a long list. The technology is difficult. It can not conveniently be learned from books; something resembling an apprenticeship is almost necessary. Possibly we can explain the fact that psychologists in general have only slowly accepted these new methods by noting that under such conditions knowledge is diffused slowly.

Many psychologists may never wish to acquire the competence necessary for detailed research in reinforcement, but there is another application which is of broader significance. A clinical psy-

chologist recently complained (2) that learning theory told him nothing about important aspects of human behavior. It would not explain, for example, why a man would seek "little bits of punishment in order to accept a big punishment." He may be right in saying that learning *theory* does not tell him much, but the example he chose is just the kind of complex arrangement of contingencies which is now under intensive investigation. And he is asking for just the kind of interpretation of human affairs which is emerging from this *work*. The world in which man lives may be regarded as an extraordinarily complex set of positive and negative reinforcing contingencies. In addition to the physical environment to which he is sensitively attuned and with which he carries on an important interchange, we have (as he has) to contend with social stimuli, social reinforcers, and a network of personal and institutional control and countercontrol—all of amazing intricacy. The contingencies of reinforcement which man has made for man are wonderful to behold.

But they are by no means inscrutable. The parallel between the contingencies now being studied in the laboratory and those of daily life cry for attention—and for remedial action. In any social situation we must discover *who* is reinforcing *whom* with *what* and to *what effect*. As a very simple example, take the aggressive child. When two young children are left alone in a room with a few toys, conditions are almost ideal for shaping up selfish and aggressive behavior. Under these circumstances one child's reinforcement is the other child's punishment, and vice versa. When I once discussed this example with a group of teachers, one of them exclaimed: "Yes, and that's why in the nursery schools of the Soviet Union the toys are so big it takes two children to play with them!" Possibly that is one solution. Certainly there are many others. When contingencies of reinforcement are properly understood, we can not thoughtlessly allow damaging contingencies to arise or go unremedied. By taking a little thought it is now possible to design social situations which have happier consequences for everyone.

I am not saying that any one set of contingencies explains aggression in children or that it takes a long apprenticeship in reinforcement research to understand that case. It is the very existence of reinforcing contingencies which must first be recognized—and that is not always easy. Here

is a slightly less obvious case. The current nationwide problem of school discipline is frequently, though possibly erroneously, attributed to progressive education. Whatever its explanation, it is a serious problem. How can we recapture the orderly conduct once attributed to "discipline," without reinstating all the undesirable by-products of an inhumane aversive control? The answer is: use positive reinforcement instead of punishment. But, how? A first step is to analyze the reinforcing contingencies in the classroom. In particular, what reinforcers are available to the teacher? The answer to that question is sometimes discouraging, but even in the worst possible case she can at least reinforce a class by dismissing it. The point is that she must understand that dismissal is reinforcing if she is not to throw away the small measure of power it offers her. The "natural" thing is for a teacher to dismiss the class when its conduct is most aversive to her. But this is exactly the wrong thing to do, for she then differentially reinforces the very behavior she wants to suppress. A teacher who understands reinforcement will survey the class during the final minutes of a period and choose for dismissal the moment at which things are going as well as can be expected. The effect will not be evident the first day, it may not be the second or third, and it may never be enough to solve all her problems; but a careful husbanding of small reinforcers and the nurturing of proper contingencies is a program well worth exploring.

As a final and more technical example of the use of reinforcement in interpreting human affairs, take the always interesting form of behavior called gambling. Gamblers appear to violate the law of effect because they continue to play even though their net reward is negative. Hence it is often argued that they must be gambling for other reasons. To the psychoanalyst the gambler may simply be punishing himself. Others may insist that the attraction is not money but excitement or that people gamble to get away from a humdrum life. Now, all gambling devices arrange a variable-ratio schedule of reinforcement, and our explanation of the performance generated by that schedule embraces the behavior of the gambler. It happens to be relatively *excited* behavior, but this, as well as the fact that there is no net gain, is irrelevant in accounting for the performance. A pigeon, too, can become a pathological gambler, and it is unlikely that

it does so to punish itself, or for the excitement, or to get away from it all.

Such expressions may not be meaningless. The complex contingencies involved in "self-punishment" may well be involved, although quantitative evidence would be needed to show this. "Getting away from it all" reminds us that some schedules are aversive. Herrnstein and Morse have shown that a pigeon can be conditioned to peck one key if this is occasionally followed by the opportunity to take time off from another key. In turning to a variable-ratio system of reinforcement, then, the gambler may well be escaping from other schedules. Moreover, a variable-ratio schedule at suitable values is reinforcing. These facts account for any behavior which brings an organism under a variable-ratio schedule, but they do not explain the performance once this schedule is in force. The conditions which prevail under the schedule are the relevant facts.

These are necessarily fragmentary examples of the contribution of an experimental analysis of intermittent reinforcement to our understanding of human behavior, but they may serve to make an important point. The relevance of reinforcement is often quite unexpected. These examples are not part of the classical field of learning; they are matters of *motivation*! One expects to see them discussed by dynamic psychologists, psychologists of personality, or psychoanalysts, not by people who study white rats and pigeons. True, learning theory has long been applied to psychotherapy, but traditional research in learning has not made a very helpful contribution. Suddenly, reinforcement takes on new dimensions. When Freud was once asked whether psychoanalysis and psychology were the same, he insisted that psychoanalysis embraced all of psychology except the physiology of the sense organs (6). This was an ambitious statement, and perhaps a similar claim for reinforcement would be equally unjustified. Yet the facts of human behavior fall to the psychoanalyst and the student of reinforcement alike for explanation. But where the analyst has studied behavior in a given environment as the manifestation of hidden (even if eventually-to-be-revealed) forces, we can now interpret the same behavior and environment as a set of reinforcing contingencies. In doing so we gain a tremendous advantage, for all terms necessary for such an analysis lie within an observable and often

manipulable universe. Beyond the prediction and control made possible by recent research in reinforcement lies the broader field of interpretation. And it is a kind of interpretation so closely allied with prediction and control that positive and successful action are frequently within easy reach.

If I have suggested to psychologists in general that they will find much of interest in the modern study of reinforcement, it will be appropriate to end with a few words of caution.

1. This kind of research is difficult and relatively expensive. In our book on schedules of reinforcement, Ferster and I report on 70,000 hours of continuously recorded behavior composed of about one quarter of a *billion* responses. The personal observation of behavior on such a scale is unthinkable. The research must be heavily instrumented. The programming of complex schedules demands not only a large budget but considerable skill in relay engineering, neither of which is common in psychological laboratories.

2. It is usually single-organism research. Any other experimental method is often impossible. When an experiment on one pigeon runs to thousands of hours, it can not be repeated on even a modest group of, say, ten subjects—at least if one wants to get on with other matters. Fortunately, a statistical program is *unnecessary*. Most of what we know about the effects of complex schedules of reinforcement has been learned in a series of discoveries no one of which could have been proved to the satisfaction of a student in Statistics A. Moreover, a statistical approach is just *wrong*. The curves we get can not be averaged or otherwise smoothed without destroying properties which we know to be of first importance. These points are hard to make. The seasoned experimenter can shrug off the protests of statisticians, but the young psychologist should be prepared to feel guilty, or at least stripped of the prestige conferred upon him by statistical practices, in embarking upon research of this sort.

3. The research is not theoretical in the sense that experiments are designed to test theories. As I have pointed out elsewhere (4), when lawful changes in behavior take place before our very eyes—or, at most, only one step removed in a cumulative curve—we lose the taste, as we lose the need, for imagined changes in some fanciful world of neurones, ideas, or intervening variables. Here

again tradition throws up a roadblock. Certain people—among them psychologists who should know better—have claimed to be able to say how the scientific mind works. They have set up normative rules of scientific conduct. The first step for anyone interested in studying reinforcement is to challenge that claim. Until a great deal more is known about thinking, scientific or otherwise, a sensible man will not abandon common sense. Ferster and I were impressed by the wisdom of this course of action when, in writing our book, we reconstructed our own scientific behavior. At one time we intended—though, alas, we changed our minds—to express the point in this dedication: "To the mathematicians, statisticians, and scientific methodologists with whose help this book would never have been written."

The difficulties which have stood in the way of the advancing study of reinforcement will undoubtedly continue to cause trouble, but they will be more than offset by the powerful reinforcing consequences of work in this field. Techniques are now available for a new and highly profitable exploration of the human behavior at issue in education, commerce and industry, psychotherapy, religion, and government. A program of cultural design in the broadest sense is now within reach. Sociologists, anthropologists, political scientists, economists, theologians, psychotherapists, and psychologists have long tried to reach an understanding of human behavior which would be useful in solving practical problems. In that technological race a dark horse is coming up fast. The new principles and methods of analysis which are emerging from the study of reinforcement may prove to be among the most productive social instruments of the twentieth century.

REFERENCES

1. FERSTER, C. B., & SKINNER, B. F. *Schedules of reinforcement*. New York: Appleton-Century-Crofts, 1957.
2. SHEEHAN, J. G. The marital status of psychoanalysis and learning theory. *Amer. Psychologist*, 1957, 12, 277-278.
3. SKINNER, B. F. *The behavior of organisms*. New York: Appleton-Century-Crofts, 1938.
4. SKINNER, B. F. Are theories of learning necessary? *Psychol. Rev.*, 1950, 57, 193-216.
5. SKINNER, B. F. *Science and human behavior*. New York: Macmillan, 1953.
6. WORTIS, J. *Fragments of an analysis with Freud*. New York: Simon & Schuster, 1954.

CENTRAL STIMULATION AND OTHER NEW APPROACHES TO MOTIVATION AND REWARD¹

NEAL E. MILLER

Yale University

THE preceding, characteristically brilliant paper by Fred Skinner (marred by a few minor theoretical and statistical aberrations) has shown you the important effects of schedules of reinforcement, and the relatively direct application of these effects to practical situations. The focus of my paper will be on quite a different problem: that of determining how motivations and rewards produce their effects. While the immediate practical implications will not be so obvious, it is a well-known fact that the deeper understanding of basic phenomena almost always leads to significant practical applications, frequently being the necessary foundation for radical innovations.

You are well aware that problems of motivation and reward, which incidentally shade off into mood and temperament, have wide clinical, social, and educational implications. I believe we are at last developing new techniques for getting inside of the organism, manipulating and measuring some of the simpler, more basic things that are going on there, and thus are laying the foundations for fundamental advances in our understanding of the mechanisms of motivation and reward.

COMBINATION OF BEHAVIORAL AND PHYSIOLOGICAL TECHNIQUES

The recent spurt of fruitful research on the mechanisms of motivations has emerged as a result of the convergence of two lines of development. Physiologists, pharmacologists, and biochemists have been developing new and subtler tools for radically affecting and measuring organic processes. At the same time, experimental psychologists have been developing a variety of more effective techniques for measuring drives. The combination of techniques from these two sources is beginning to yield results which have exciting potentialities.

In this brief presentation I can only sample a

few of these results. I shall include some pictures to give you a firsthand impression of the work.

An Early Study of Hunger

Using the improved electrolytic technique for making lesions deep in the more primitive structures of the brain, Hetherington and Ranson (12) found that lesions in the region of the ventromedial nuclei of the hypothalamus would cause albino rats to overeat enormously so that, as Fig. 1 shows, they became very fat. But Bailey, Stevenson, and I (25) used behavioral tests to show that these lesions do not necessarily always potentiate hunger. Although our rats would eat more, they would not work as hard for food. Furthermore, they were stopped by smaller doses of quinine. Thus the additional behavioral tests did not support the original inference of increased hunger drawn from the measure of amount of food consumed. It seemed more reasonable to assume that the lesion interfered with complete satiation.

In the foregoing study, the single test of amount of food consumed disagreed with the rate of bar pressing and a number of other behavioral measures. Other studies, summarized elsewhere (18), show that certain circumstances can affect the rate of bar pressing, so the results of this test will disagree with those of a number of different tests. Discrepancies among tests purporting to measure the same thing raise important problems which the aptitude testers have long since explored: namely, problems of general versus specific factors, and of the purity of various measures of such factors.² But our main point for the moment is that it is prudent and extremely fruitful to use a variety of behavioral tests in studying a drive such as hunger. We are just beginning to cash in on the potentialities of these tests; to date most studies of the physiological mechanisms of hunger are still lim-

¹ The preparation of this paper, as well as most of the author's studies cited in it, was supported by a research grant M 647 from the National Institute of Mental Health, United States Public Health Service.

² For a discussion of the design required, but seldom used, to test for the unity and generality of intervening variables such as drives, see (20).

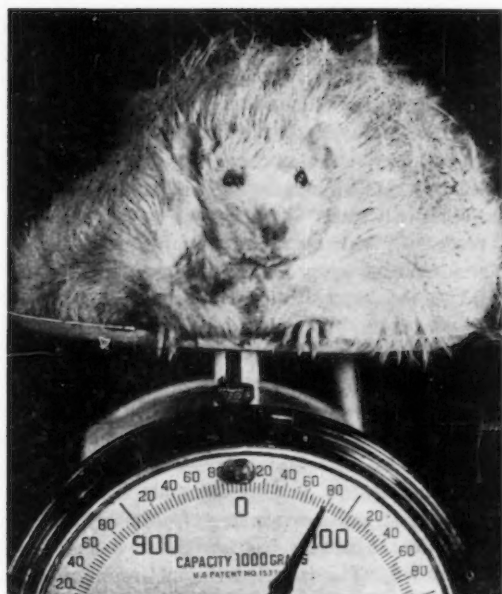


FIG. 1. Effects of overeating produced by lesions in the region of the ventromedial nuclei of the hypothalamus. (Picture by J. A. F. Stevenson.)

ited to the single measure of the amount of food consumed (17).

Sample of Other Brain-Lesion Studies

Lesions in the same general region as those producing overeating can markedly change the temperament of the rat. Anand and Brobeck (1) found that such lesions in the hypothalamus could make rats far more aggressive (a finding which Bailey, Stevenson, and I confirmed on our fingers) and that lesions in the region of the amygdala could abolish this hyperaggressiveness. Similarly, Brady and Nauta (6) have shown that lesions in the septal region can produce heightened startle responses and, with the interesting exception of conditioned suppression (CER), a variety of other indications of increased emotionality. An abstract by King (13) indicates that his paper shows that such emotionality can also be counteracted by lesions in the amygdaloid complex.

In addition to making the animals much tamer, lesions in the region of the amygdala can also produce marked hypersexuality. This is part of the classical Klüver-Bucy (14) syndrome which has been one of the points of departure for many excel-

lent studies of the effects of brain lesions on motivation (e.g., 28, 30, 31, 33).

In the past, the combination of the ablation technique with behavioral tests has been found to be a powerful method for studying sensory, perceptual, and motor functions of the brain. The same combination is becoming a powerful technique for studying also the motivational and emotional functions of the brain. I have cited only a small sample out of the increasingly impressive population of sophisticated studies by able men in this field.

Drive Elicited by Electrical Stimulation

Electrical stimulation of specific points has been another classical technique for studying brain function. Originally, this technique was used to study motor effects on anaesthetized animals. In his classic work, Hess (11) refined this technique by permanently implanting electrodes in the brains of cats so that they could be stimulated in the normal unanaesthetized state. In addition to eliciting complex motor and postural responses, which were less like reflexes and more like acts, Hess discovered that stimulation in the hypothalamus produced a variety of apparently motivational effects such as rage, flight, and eating. His trail-blazing results, which were limited to naturalistic observation, have provided an excellent point of departure for recent studies using a variety of more rigorous behavioral tests.

Let me illustrate by brief excerpts from a film joined together by pieces of black leader to form a series of animated slides. First we see a cat with electrodes permanently implanted in his brain. As soon as he is stimulated, he lowers his head and



FIG. 2. Electrical stimulation of the brain causes a thoroughly satiated rat to eat.



FIG. 3. Since the brain stimulation can also cause the rat to bite inedible objects, one wonders whether it elicits true hunger or only responses of gnawing.

starts lapping up water. This cat has Delgado-type electrodes ending in subminiature radio sockets so that the wires can be plugged into his head. The demonstration of drinking is very effective. But when the dish is moved a few inches to one side, the cat lowers his head and licks the floor. This simple test shows that we obviously are not eliciting normal thirst, but only a reflex licking response. Other less extreme examples require considerably more subtle tests.

Turning now to some work in collaboration with E. E. Coons, we see in Fig. 2 a rat with electrodes

placed in a region where stimulation elicits eating. This rat has been thoroughly satiated on food. Soon after stimulation is turned on, the rat starts to eat; soon after it is turned off, he stops. Again, the demonstration is very effective.

But Fig. 3 shows that these rats, like Hess's cats, will sometimes also gnaw at inedible objects such as pieces of wood. Therefore, we wonder whether the centrally elicited eating has the properties of normal hunger or is mere reflex gnawing. As a test, we thoroughly trained rats, when thirsty, to get water from a spout above; and, when hungry, to get food by pushing aside a little hinged door below. Then, after thorough satiation, we tested the effects of electrical stimulation. In Fig. 4 you can see that the stimulation can cause a moderately thirsty rat to leave the water spout where he has been drinking and go to a different place to perform the instrumental response of pushing back the hinged door which he has learned as a means of getting food. The fact that the rat stops drinking shows that the effects of stimulation are not mere indiscriminate activation. The fact that the stimulation elicits the learned response of pushing aside the hinged door shows that it has at least some of the more general motivating properties of normal hunger.

In order to make the results completely official, we also trained the rats, when hungry, to secure food by pressing a Skinner bar which delivered small pellets on a variable-interval schedule. Fig. 5 shows the effects of brain stimulation on a thoroughly satiated rat. (Each time the rat presses the bar, the recording lever moves upwards slightly. Each time a bar press actually delivers food, the

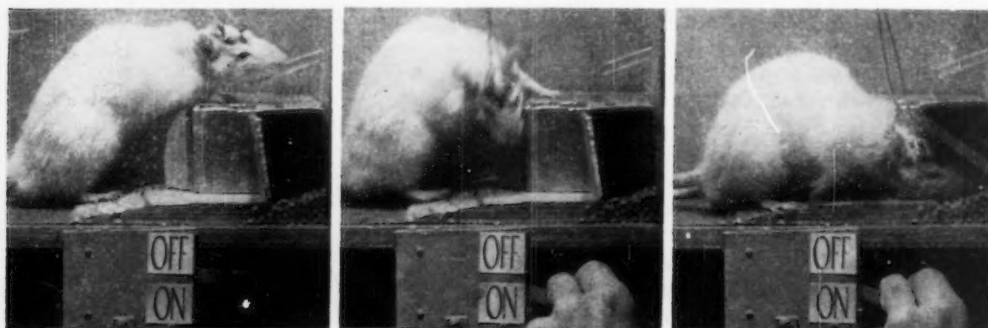


FIG. 4. In a critical test, electrical stimulation of the brain causes a moderately thirsty rat to stop drinking at a water spout and go to a different place to perform a learned response, pushing back a hinged door to get food.

pen draws a downward spike.) Horizontal sections of the cumulative record show that the satiated rat did relatively little work at the bar during two-minute periods of nonstimulation. The upward steps show that, during the two minutes when the stimulation was on, the rat worked at the bar which occasionally delivered food. Thus we have further evidence that electrical stimulation in the areas that induce eating will also motivate the performance of learned instrumental responses that have been reinforced by food. The results are convincing pictorially; they also are statistically reliable.

Continuing our program of testing point-by-point whether the motivation elicited by the electrical stimulation of the brain has all of the properties of normal hunger, Coons and I found that its effects were not limited to the gnawing of solid foods; it caused a satiated rat to drink milk. In control tests the stimulation did not elicit similar sustained drinking of water. Furthermore, the stimulation could be used to motivate the rat to run a T maze with the termination of the stimulation serving as a reward to produce highly reliable choice of the endbox in which the stimulation was turned off. In short, the termination of centrally stimulated "hunger" by turning off the switch seems to have the same rewarding effects as the eating of food which ordinarily terminates normally elicited hunger.

Let us turn now to a different type of motivation: a pain-fear-like emotional disturbance which can be elicited by electrical stimulation in a number of regions deep in the brain (8). Does this emotional reaction have all of the functional properties of normally aroused pain and fear? Some of

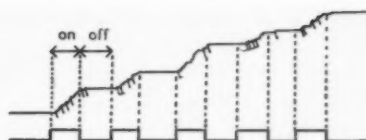


FIG. 5. Stimulation in the hypothalamus elicits the learned response of bar pressing in a satiated rat. Each bar press moves the pen up a little. The rat has been trained on a variable-interval schedule; each spike below the record indicates when a bar press actually delivers food.

these properties are: (a) Pain and fear can motivate, and their termination reinforce, trial-and-error learning. (b) They can be used to establish a conditioned response. (c) They can serve as a punishment to establish an approach-avoidance conflict so that a hungry animal will avoid food.

The purpose of the experiments is to demonstrate point-by-point that central stimulation of the critical places in the brain has all of the foregoing properties.

Figure 6 illustrates the first of these experiments. It shows a cat with chronic Delgado-type electrodes ending in subminiature tube sockets into which are plugged the wires bearing the stimulation. This cat first learned to rotate a paddle wheel to turn off electric shock. Then he was tested with brain stimulation. As soon as the stimulation was delivered, the cat became active and, after a few irrelevant responses, rotated the wheel which turned off the stimulation and thus rewarded the response of rotating the wheel. After a few trials, facilitated by transfer from the previous training, the cat learned to rotate the wheel as soon as the stimulation was turned on. Fig. 6 shows him per-

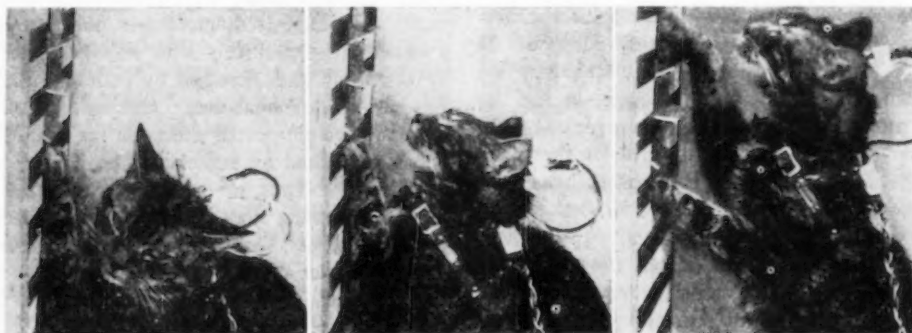


FIG. 6. Electrical stimulation of a pain-fear area in a cat's brain elicits a learned response: rotating a wheel which turns off the stimulation. Stimulation is turned on between the first and second pictures. (From a motion picture by Miller, Delgado, and Roberts, shown by the author at the 1953 meeting of the APA.)

forming this habit motivated by electrical stimulation of the brain.

In the next experiment, preliminary tests showed that a tone was a neutral stimulus which produced no obvious response. Then for a number of trials the tone was immediately followed by the brain stimulation which elicited wheel turning. After a few such trials, the wheel turning was conditioned: the tone alone, without brain stimulation, caused the cat to turn the wheel.

In the final experiment, we found that stimulation in the sensorimotor area of a hungry control cat, which was eating, produced a violent withdrawal from food; but even after repeated stimulation, the control animals promptly returned to eat. By contrast, experimental cats, stimulated once or twice with a lower voltage in the critical area of the brain, learned to avoid the food.

These experiments have shown that brain stimulation at critical points can have a number of the significant properties of normally elicited pain and fear. In addition to illustrating a general approach to the problem of investigating motivational factors elicited by electrical stimulation of the brain, experiments of the foregoing type may yield information which will help us in knowing where to place lesions in order to relieve certain hitherto hopeless patients from the acute misery of intractable pain.

Similar experiments on centrally aroused aggression have elicited a spectacular and relatively well-integrated cluster of symptoms of rage—hissing, spitting, clawing, etc.—which suggest that rage contains some integrated motor components different from fear (24). So far, however, Warren Roberts and I have confirmed Masserman's results (16) in that we have not been able to condition such responses. This raises an interesting question. Is anger a distinctive drive whose mechanisms we have simply failed to date to locate, or are the motor components involved in rage organized without any separate, distinctive drive so that they must be motivated by other drives such as fear, hunger, or sex?

The results of these experiments are enough to illustrate that the combination of the physiological technique of electrical stimulation with various behavioral techniques for measuring the effects of such stimulation is turning out to be a powerful new tool for investigating the motivational functions of the brain.

Reward Effects of Electrical Stimulation

The combination of the techniques for stimulating the brains of unanaesthetized animals with those of exact behavioral testing led Olds and Milner (27) to a completely unexpected discovery. They found that electrical stimulation of certain areas of the brain would act as a powerful reward. This reward could be used to cause animals to choose the correct side of a T maze or to press a bar in a Skinner box. Often in the history of science, the unexpected discovery of a novel phenomenon, such as X-rays or radioactivity, has forced drastic revisions in current theory and ultimately led to important practical developments. While it is too early to be certain exactly how important will be the effects of this unexpected discovery by Olds and Milner, I suspect they will be considerable.

On the theoretical front, the rewarding effect of central stimulation tends to revive hedonistic theories of reinforcement. As I have pointed out elsewhere, however, the results known to date can be fitted in fairly well with any of the current theories of reinforcement, and the drive-reduction hypothesis suggests a number of interesting lines of investigation in the area of centrally rewarding effects (22). The important thing is that we have here a genuinely novel phenomenon and a completely new technique for investigating the mechanism of reward and its relationship to various drives.

This new discovery has touched off a flurry of research which is still mounting with positive acceleration. Olds (26) has shown that there are certain regions of the hypothalamus where the rate of bar pressing increases with hunger much as it would if the animals were receiving a food reward. In a slightly different area, the rate of bar pressing varies positively with sex—being reduced by castration and increased by androgen therapy. Furthermore, different drugs, such as tranquilizers, seem to have differential effects on the reward phenomenon elicited by stimulation in different parts of the brain. Thus, we probably have here a technique for learning more about how drugs affect different parts of the brain and also for screening drugs in order to discover ones that have more specific psychological effects.

Paradoxical Dual Effects

The experiments which I performed in collaboration with Delgado and Roberts (8) showed that

stimulation of certain points in the brain can serve as a punishment. The experiments by Olds and Milner (27) showed that stimulation at other points of the brain can serve as a reward. One of my students, Roberts (29), has recently shown that stimulation in other places may paradoxically function first as a reward and then as a punishment. Bower and I (5) have described further work along this line.

Figure 7 shows pictures of a rat with electrodes at a point in the anterior portion of the medial forebrain bundle which elicits these paradoxical dual effects. Pressing the bar turns the stimulation on. As you can see, immediately after having pressed the bar the rat turns away and goes to rotate a wheel which terminates the stimulation, then he returns to press the bar again, continuing to repeat the sequence. I believe that this phenomenon may conceivably give us a technique for studying drugs that accentuate the positive rewarding function of the brain and minimize the negative punishing ones.

Motivational Effects of Drugs

One of my students, Robert Kirschner, used an apparatus much like the one illustrated in Fig. 7 except that the bar and wheel were replaced by two bars diagonally across a corner from each other in order to equalize the skill and effort required to turn the stimulation on or off. Studying the effects of methamphetamine and chlorpromazine, he found that 2 mg/k of the former and 4 mg/k of the latter produced roughly equivalent reductions in the total number of bar presses.

But, when the rewarding and aversive effects were analyzed separately, these two drugs had strikingly different effects. The methamphetamine increased the time to turn the stimulation off while decreasing the time to turn it on. By contrast, the chlorpromazine produced a great increase in the time to turn the stimulation on and also some increase in the time to turn it off. One interpretation of these results is that methamphetamine was accentuating the positive rewarding effects and minimizing the negative punishing ones—a result congruent with its clinical euphoric effects. Chlorpromazine seemed to be reducing reward more than the aversion—a result congruent with the fact that it sometimes causes patients to feel depressed.

The organic chemists are turning out thousands of new compounds and are able to produce at will

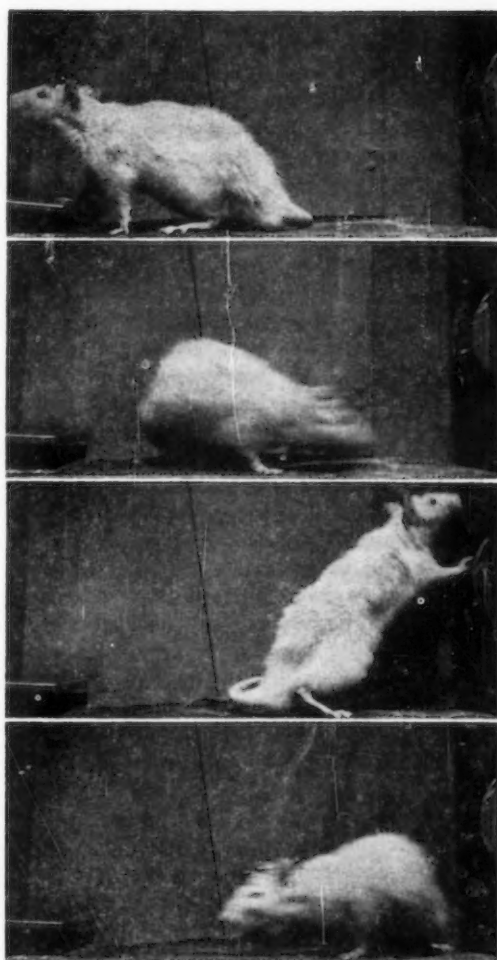


FIG. 7. Paradoxical reward-aversion effect illustrated by a rat which presses a bar to turn the stimulation on, runs to the opposite end of the apparatus and rotates a wheel to turn it off, and then returns to press the bar, continuing to repeat this sequence. (Photographed in the author's laboratory by Martin Iger for Harcourt, Brace and Company.)

slight modifications in known drugs. Similarly, the biochemists are learning more about vital hormones, enzymes, enzyme inhibitors, and other powerful agents of metabolism. But one of the chief bottlenecks to the discovery of superior psychotropic drugs is the difficulty in efficiently and safely testing for the psychological effects of all these new compounds. Perhaps this test, along with many other ingenious ones recently devised by experi-

mental psychologists, will help us in finding drugs which have more potent therapeutic effects with fewer harmful side effects. Although the current enthusiasm for the tranquilizing drugs may have the same rocketing rise and frustrating fall as other "wonder cures" for schizophrenia, I believe that the recent signs of vigorous growth of a new infant science of psychopharmacology afford a reasonable ground for eventual hope.

For the rapid growth of psychopharmacology to be healthy, however, I believe that it should soon advance beyond the stage where a single test is widely used for screening merely on the basis of its face validity. The standards and methods of modern aptitude testing should be adapted to this new area. Batteries of tests should be tried out and validated, first by the criterion of internal consistency and eventually by the criterion of predicting clinically useful effects. Both screening tests and drugs might eventually be factor analyzed. At the same time that we are refining our screening instruments, we should also be conducting pure-science studies to analyze how well-known drugs achieve their psychological effects. We need to discover fundamental laws to develop a basic science of psychopharmacology. Such a science should provide a rational basis for practical applications to mental hygiene in the same way that organic chemistry provides a basis for the analysis and synthesis of new compounds (21).

In connection with the problem of drugs, let me emphasize that there is no necessary incompatibility between organic and functional approaches to the problem of mental disease.⁸ As you know, I find it useful to describe neurosis and psychotherapy in terms of learning theory. But the book (9) which Dollard and I wrote on this topic contains a chapter on drugs and brain lesions. It is entirely possible that people differ, for example, in the strength of the innate mechanisms for fear, guilt, and anxiety just as they vary in physical size and strength. A person with unusually strong emotional mechanisms of this kind would be especially susceptible to learning strong fears and guilts by traumatic incidents. These unusually strong fears and guilts might directly elicit certain psychosomatic symptoms, produce strong conflicts, or motivate the learning of functional symptoms. It is quite conceivable that chronic medication by

suitable drugs could reduce this special susceptibility to irrationally strong fears and guilts much as insulin enables the diabetic to tolerate a diet containing more carbohydrates.

Furthermore, drug effects have the great advantage over certain other forms of organic intervention in that they are reversible. Some interesting results have already been secured by combining the use of barbiturates with psychotherapy. It is conceivable that a superior drug will be produced which will be a much more effective aid to emotional re-education. Indeed, it is conceivable that radically improved results with certain forms of mental disease may be achieved by an unconventional combination of drug therapy, individual therapy, group therapy, training in social skills, and temporary manipulation of the environment.

Biochemical Stimulation

In addition to electrical techniques of stimulation, new biochemical techniques (which obviously have implications also for psychopharmacology) have recently been exploited. For example, Andersson (2) has shown that minute injections of salt solution into the region of the third ventricle can cause excessive drinking in goats. Conversely, our group has shown that minute injections of water into the brain can cause a thirsty cat to stop drinking. Furthermore, we have shown that the minute salt injections increase, while the water ones decrease, the rate of performing a learned response to get water. Therefore, these minute injections into the brain have some of the more general effects of normal increases or reductions of thirst (23).

Similarly, Alan Fisher (10) has shown that a minute injection of male hormone into a specific site in the brain can induce complex sexual, and in some instances maternal, behavior as though it had a motivating effect. Since similar effects were not produced by electrical stimulation of the same sites, there is reason to believe that, in some instances at least, the chemical stimulation may be more effective and selective than the electrical technique. Here again, we have a powerful new tool, the potentialities of which are just beginning to be explored.

Electrical Recording of Brain Activity

The converse of the stimulation technique is that of recording electrical activity of the brain and other parts of the nervous system. This technique

⁸ For a more detailed discussion, see (19).

has been used with great success in tracing sensory systems and has recently produced some quite exciting results which may help to explain the mechanism for the relationship between motivation and attention. For example, it has been found that stimulation of the reticular system in the brain can actually reduce the transmission of sensory impulses from the end organs and through lower relay centers, thus partially shielding the brain from certain sources of stimulation. As Livingston (15) has pointed out, this finding produces a radical change in our previous notions of sensory neurophysiology.

Can these new techniques be applied to other motivational phenomena? For example, Pavlov reports that, when a somewhat painful stimulus is made the conditioned stimulus for food, all of the obvious emotional responses to pain seem to drop out. By using suitable recording techniques, could we demonstrate that the pain impulses themselves are reduced before they reach the highest centers? Would we have an experimental method for producing and studying a phenomenon analogous to hysterical anaesthesia?

Although techniques for recording the electrical activity of the nervous system have been used very successfully in the study of sensory mechanisms, they have not been used much in the study of drive and reward. Here seems a promising new area of application, although there are technical difficulties to overcome. For example, if an animal's motor responses (which disturb electrical recording) were eliminated by one of the improved curare derivatives, such as flaxidil, would we find that the electrical activity in different tracts and centers of the brain is altered when the animal is hungry, thirsty, or suffering painful stimulation? What would be the effects of rewards such as water injected directly into the blood stream of a thirsty animal, if indeed it can be demonstrated that such injections function as a reward? Would there be any effects specific to stimulation of the brain at points where such stimulation is rewarding and different from those at points where it is neutral or aversive? Any such differences are likely to give us significant clues to the basic mechanisms of motivation and reward (22).

OTHER PROMISING APPROACHES

Now fasten your seat belts for a final spurt through a number of different approaches for which

the brevity of listing does not mean any inferiority in merit.

Recently Roger Russell's group has been studying the effects of what might be called biochemical lesions of the brain, while David Krech and Mark Rosenzweig have been pursuing the relationships among brain chemistry, heredity, and behavior. While these new lines of work have been aimed chiefly at cognitive functions, they could easily turn up facts which would lead directly into problems of motivation and reward.

Most of the studies I have sampled thus far have involved relatively direct approaches to the brain. The combination of exact behavioral tests with various "intermediate" techniques has also proved fruitful. Some of the techniques used in this way have been a fistula into the stomach, a cannula into a vein, a subcutaneous saline injection, enzyme inhibitors, and unusual substances which are similar to a metabolite in one respect but different in others. Programs involving such work are well under way in Mayer's laboratory at Harvard (3), Stellar's (32) at Pennsylvania, and our own laboratory at Yale (24). Similarly, Beach (4) and his students are introducing a greater variety of behavioral techniques into the study of sex.

Thus far, various approaches usually have been used in relative isolation. Additional advances may be expected when more use is made of systematic combinations of these approaches. For example, appropriately placed lesions might be used in the analysis of the systems involved in the drive or reward effect of brain stimulation or of the different effects of distending the stomach with either food or a balloon.

Finally, a completely different and highly promising development has been the use of behavioral techniques to bring new drives into the laboratory: first fear, then curiosity, and most recently social deprivation. We can and should extend the range of drives experimentally studied. But that is another story (20).

REFERENCES

1. ANAND, B. K., & BROBECK, J. R. Food intake and spontaneous activity of rats with lesions in the amygdaloid nuclei. *J. Neurophysiol.*, 1952, 15, 421-430.
2. ANDERSSON, B. The effect of injections of hypertonic NaCl solutions into different parts of the hypothalamus of goats. *Acta Physiol., Scand.*, 1953, 28, 188-201.

3. ANLIKER, J., & MAYER, J. The regulation of food intake: Some experiments relating behavioral, metabolic and morphologic aspects. *Amer. J. clin. Nutr.*, 1957, 5, 148-153.
4. BEACH, F. A. Characteristics of masculine "sex drive." In M. R. Jones (Ed.), *Nebraska symposium on motivation*. Lincoln: Univer. Nebraska Press, 1956.
5. BOWER, G., & MILLER, N. E. Paradoxical rewarding and aversive effects from stimulating the same place in a rat's brain. *Amer. Psychologist*, 1957, 12, 464. (Abstract)
6. BRADY, J. V., & NAUTA, W. J. H. Subcortical mechanisms in emotional behavior: The duration of affective changes following septal and habenular lesions in the albino rat. *J. comp. physiol. Psychol.*, 1955, 48, 412-420.
7. BROWN, J. The generalization of approach responses as a function of stimulus intensity and strength of motivation. *J. comp. Psychol.*, 1942, 33, 209-226.
8. DELGADO, J. M. R., ROBERTS, W. W., & MILLER, N. E. Learning motivated by electrical stimulation of the brain. *Amer. J. Physiol.*, 1954, 179, 587-593.
9. DOLLARD, J., & MILLER, N. E. *Personality and psychotherapy: An analysis in terms of learning, thinking and culture*. New York: McGraw-Hill, 1950.
10. FISHER, A. Maternal and sexual behavior induced by intracranial chemical stimulation. *Science*, 1956, 124, 228-229.
11. HESS, W. R. *Das Zwischenhirn: Syndrome, Lokalisationen, Funktionen*. (2nd ed.) Basel: Schwabe, 1954.
12. HETHERINGTON, A. W., & RANSON, S. W. The relation of various hypothalamic lesions to adiposity in the rat. *J. comp. Neurol.*, 1942, 76, 475-499.
13. KING, F. A. Effects of amygdaloid lesions upon septal hyperemotionality in the rat. *Amer. Psychologist*, 1957, 12, 466. (Abstract)
14. KLÜVER, H., & BUCY, P. C. Preliminary analysis of functions of the temporal lobes in monkeys. *Arch. Neurol. Psychiat.*, 1939, 42, 979-1000.
15. LIVINGSTON, R. B. Central control of afferent activity. In H. H. Jasper, et al. (Ed.), *Henry Ford hospital international symposium: Reticular formation of the brain*. Boston: Brown, in press.
16. MASSERMAN, J. H. Is the hypothalamus a center of emotion? *Psychosom. Med.*, 1941, 3, 3-25.
17. MILLER, N. E. Shortcomings of food consumption as a measure of hunger: Results from other behavioral techniques. *Ann. N.Y. Acad. Sci.*, 1955, 63, 141-143.
18. MILLER, N. E. Effects of drugs on motivation: The value of using a variety of measures. *Ann. N.Y. Acad. Sci.*, 1956, 65, 318-333.
19. MILLER, N. E. A psychologist speaks. In H. D. Kruse (Ed.), *Integrating the approaches to mental disease*. New York: Paul B. Hoeber, 1957.
20. MILLER, N. E. Liberalization of basic S-R concepts: Extensions to conflict behavior and social learning. In S. Koch (Ed.), *Psychology: A study of a science*. Vol. II. *General systematic formulations, learning and special processes*. New York: McGraw-Hill, in press.
21. MILLER, N. E. Objective techniques for studying motivational effects of drugs on animals. In S. Garattini & V. Ghatti (Eds.), *Psychotropic drugs*. Amsterdam: Elsevier; New York: Van Nostrand, 1957.
22. MILLER, N. E. Comments on the implications of the Olds reward effect for theories of reinforcement. In D. E. Sheer (Ed.), *Electrical stimulation of the brain: Subcortical integrative systems*. Houston: Univer. Texas Press, in press.
23. MILLER, N. E. Learning and performance motivated by direct stimulation of the brain. In D. E. Sheer (Ed.), *Electrical stimulation of the brain: Subcortical integrative systems*. Houston: Univer. Texas Press, in press.
24. MILLER, N. E. Experiments on motivation: Studies combining psychological, physiological, and pharmacological techniques. *Science*, 1957, 126, 1271-1278.
25. MILLER, N. E., BAILEY, C. J., & STEVENSON, J. A. F. Decreased "hunger" but increased food intake resulting from hypothalamic lesions. *Science*, 1950, 112, 256-259.
26. OLDS, J. Self-stimulation of the brain: Used to study local effects of hunger, sex and drugs. *Science*, in press.
27. OLDS, J., & MILNER, P. Positive reinforcement produced by electrical stimulation of septal area and other regions of rat brain. *J. comp. physiol. Psychol.*, 1954, 47, 419-427.
28. PRIBRAM, K. H., & WEISKRANTZ, L. A comparison of the effects of medial and lateral cerebral resections on conditioned avoidance behavior in monkeys. *J. comp. physiol. Psychol.*, 1957, 50, 77-80.
29. ROBERTS, W. W. Both rewarding and punishing effects from stimulation of posterior hypothalamus with same electrodes at same intensity. *J. comp. physiol. Psychol.*, in press.
30. ROSVOLD, H. E., MIRSKY, A. F., & PRIBRAM, K. H. Influence of amygdectomy on social behavior in monkeys. *J. comp. physiol. Psychol.*, 1954, 47, 173-178.
31. SCHREINER, L., & KLING, A. Rhinencephalon and behavior. *Amer. J. Physiol.*, 1956, 184, 486-490.
32. STELLAR, E. Physiological psychology. In P. R. Farnsworth (Ed.), *Annual review of psychology*. Vol. 8. Palo Alto, Calif.: Annual Reviews Inc., 1957.
33. WATERHOUSE, I. K. Effects of prefrontal lobotomy on conditioned fear and food responses in monkeys. *J. comp. physiol. Psychol.*, 1957, 50, 81-88.

THE MOTIVATING EFFECTS OF EXTEROCEPTIVE STIMULATION

D. O. HEBB

McGill University

MY instructions from the man who cracked the whip—in the role of Chairman of this symposium—were to center my talk about the effects of perceptual deprivation on human motivation and the study of brainwashing made at McGill. It's obvious, no one can *really* deal with my topic in a 20-minute paper and also go on and talk about broad implications. So I'll make no pretence at covering the field. But if I see a chance to make a broad remark, of course, I will.

THE INFANT'S ENVIRONMENT

What we are considering here is the relation of the mammal to his sensory environment. To put this in perspective I shall start with perceptual deficit in infancy, as far as it bears on motivational and emotional problems. As you know, it is now clear that such a deficit also produces intellectual defects at maturity (1, 7, 12), but this I am not directly concerned with, except as it bears incidentally on social intelligence. Also, I am going to restrict this further to the dog, an animal that shows *some* of the complexities of temperament found in the higher species—more so than the rat, certainly. The work I refer to is mainly that of Thompson, Melzack, Heron, and Mahut (5, 14, 16–18, 20–23). These studies of temperamental variables have shown, like those on intelligence, that the normal development of behavior depends on a normal perceptual environment. The animal reared in isolation is a permanent screwball at maturity: motivationally, socially, intellectually abnormal.

These rearing experiments, of course, relate to the early observations of Spitz (19) concerning "hospitalism" and social deprivation of the hospitalized infant, and to the later observations of Bowlby (4) and others, also on hospitalized children. It is important to mention also such reports of single human subjects, reared in pretty extreme isolation, as those of Davis (6), Hill and Robinson (11), and Mason (15). But in these human cases,

of course, there are a number of uncontrolled variables, making interpretation difficult indeed.

The animal experiments not only have the advantage of experimental control; they also make it possible to observe long-term effects, because the dog grows up in a reasonable period of time. It is quite practical to rear dogs in different ways and test not only at adolescence, so to speak, but also in young middle age. There is a lot of talk in the literature about how to rear the human animal so as to produce the kind of motivations ("personality") you want, at maturity; but the child psychologist sometimes forgets to what a great extent these statements depend on some theoretical formulation or other, and there aren't any theories that we can really trust that much.

There is no evidence whatsoever that shows factually, reliably, the effects of a particular kind of rearing, for the first six years of life, upon personality and so forth when the human subject has grown up. It's a long step from dog to man, of course, and we can't put much trust in this kind of inference either. The ideal subjects for experiment would be the anthropoid apes, but these take almost as long to grow up as man does, so this again is not really practical. Perhaps Harry Harlow will manage the trick in his rearing experiments with rhesus monkeys, but in the end we are going to have to depend on a better development of basic theory, combined with the data of animal experiments.

Anyway, let me summarize the dog-rearing experiments, as far as they bear on motivational questions. One point, first, is most important in the interpretation of the results. The dogs reared in isolation showed none of the physical debility and susceptibility to infection that Spitz reported. They developed exceptionally well: in fact, being nice and stupid, they made excellent show dogs; and William Ponman, who was in charge of the colony, filled a small display cabinet in the laboratory with first-prize ribbons won with our dogs, year after year, in dog shows. This physical vigor should be

kept in mind in considering the motivational deviations.

The restricted dogs were markedly atypical in activity measures, exploratory behavior and the search for variety, sharing of food in a single food-dish, social responsiveness to another dog, response to either threatening or friendly persons, and response to pain stimulation.

They were also low in formal problem-solving ability, of course, and this brings me to the question of their "social intelligence." Their behavior suggested repeatedly that the motivational differences, or what seemed motivational differences, were partly due to not perceiving the situation in the same way as the normal dogs and not having acquired normal ways of dealing with others. "Social intelligence" used to be in the literature, along with the abstract and mechanical varieties of intelligence, and one of the things suggested by these experiments is that it ought still to be in the literature.

How do social skills develop? It's no longer possible just to take for granted that your heredity will do it. You don't grow up to be socially perceptive, sensitive to another's attitudes, able to be friendly without overdoing it, able to conceal your own attitudes as need be, and so forth—you don't develop all the social skills that one must have to live with others simply as a matter of heredity and growth. We know, with reasonable certainty, that this aspect of intellectual function, like others, must depend on experience also. But what kind of experience, when, at what age?

This symposium of course is concerned with motivation, not cognitive processes as such; but the point is that motivation is also a function of perceptions and skills. We want to bring up children with "democratic" values; if in fact this is to be so, they must know how to put them satisfyingly into effect. It is hardly realistic for the social scientist to concentrate only on establishing desirable motivations—how long can one expect them to survive, not to extinguish, if the corresponding social skills are missing?

THE ENVIRONMENT AT MATURITY

Now we come closer home, with studies directly concerned with motivation in the adult. The infant-environment work shows that the adult is a product both of his heredity and physical environment (as necessary for growth) and of his percep-

tual experience during the growth period. Once development is complete, does the organism then become less dependent psychologically on sensory stimulation? When a man's or a woman's character is formed, his or her motivations and personality pattern established, is character or personality an entity that exists so to speak in its own right, no matter where or in what circumstances (assuming physical health and reasonable bodily welfare)?

In the Korean war the Chinese Communists gave us a shocking answer: in the form of brainwashing. The answer is No. Without physical pain, without drugs, the personality can be badly deformed simply by modifying the perceptual environment. It becomes evident that the adult is still a function of his sensory environment in a very general sense, as the child is.

I am not going to ask you to listen again to all the details of the experiments that have been done and are still being done in this country and Canada (though the Canadian experiments are over) to investigate the problem. The work of Heron, Bexton, Scott, and Doane (2, 9, 10) began when the Defence Research Board of Canada asked us in 1952 to find out what we could about the basic phenomena, with the hope that some possibilities for protection against brainwashing might turn up. Now brainwashing, as you know, takes different forms and can involve lack of sleep, fatigue, and hunger; and it makes a lot of use of having the subject write out "confessions" (or whatever you want to call them). Only one aspect was picked out for study: isolation from the environment. The isolation was drastic, but far from complete. Visual perception was completely prevented; auditory perception was cut down, perhaps, to about a quarter of normal; tactual perceptions, to perhaps a tenth of normal (but don't ask how this quantification is done!).

The result, again in brief, was an acute disturbance of the normal personality. (The effect observed by Lilly, 13, was apparently even greater than in the McGill studies.) There were great swings of motivation, which alternated between periods of apathy and an intense desire to get back to a normal environment. Any variation of sensory input was welcomed, but with this there was a lack of energy for problem solving; and, after leaving isolation, the subject found it difficult or impossible to get back to his normal work habits for about 24 hours. In addition, there were some

handsome visual hallucinations, disturbances of perception of the self, impairment of intelligence test performance, changes in the EEG, and marked visual disturbances on first emerging from isolation.

With the possible exception of the effects of propaganda, the changes were reversible, disappearing in a day or so. For the problem of brainwashing we learned something of value, which should be as widely known as possible, since we do not know who will fall into Communist hands in the future and be subjected to this—appalling, indecent, choose your own adjective—this atrocious procedure; and knowing something about it may mitigate its effects.

First, the occurrence of hallucinations can itself be terrifying to the naive subject and help to break down his resistance. If he knows that hallucinations are "normal" in these circumstances and that the effects are quite reversible, he has at least a little protection.

Second, the subject should know that his critical thinking will be impaired and that he is especially vulnerable to propaganda after being in radical isolation. Knowing this may help to resist propaganda, if the subject can keep reminding himself to make an extra critical effort. Heron's group did not try to investigate means of resistance, but did demonstrate the vulnerability to ridiculous propaganda. The subject was given talks on ghosts, poltergeists, ESP, and so forth, the experimenters deliberately propagandizing and having no truck with scientific detachment or such like. He was told that scientists are biased against psychic phenomena, that there is plenty of evidence to show the existence of ghosts, and so on—the statements being made as persuasive as possible. Control subjects were paid to listen to the same stuff and were influenced by it, but the experimental subjects significantly more. Part of this was no doubt due to the subject's eagerness to *listen*, to almost anything; again, if the prisoner being brainwashed knows in advance that he will have this weakness, he may be able to some extent to guard against it.

The effects of the propaganda were the only ones that showed signs of lasting beyond the experimental period. The groups tested two weeks later were too small to establish the point definitely, in a statistical sense, but the tentative conclusion was reinforced by incidental reports from the subjects. A number of the experimental subjects, unlike the controls, went to the library to borrow books on

psychical (*not* psychological) research, mind reading, and so forth; there were spontaneous reports of being afraid of ghosts, late at night, for the first time in the subject's experience; and reports of trying to use ESP in card-playing.

It is hardly necessary to say that the experiment, taken as a whole, was very unsettling to us. Our subjects were of course free to walk out on the experiment at any time they chose (as soon as they felt they could give up the \$20 a day pay!), but it would be very different for a man in fear of his life, with no choice in the matter and no termination in sight. It is one thing to hear that the Chinese are brainwashing their prisoners on the other side of the world; it is another to find, in your own laboratory, that merely taking away the usual sights, sounds, and bodily contacts from a healthy university student for a few days can shake him, right down to the base: can disturb his personal identity, so that he is aware of two bodies (one hallucinatory) and can not say which is his own, or perceives his personal self as a vague and ill-defined something *separate from his body*, looking down at where it is lying on the bed; and can disturb his capacity for critical judgment, making him eager to listen to and believe any sort of preposterous nonsense.

Fundamentally, this raises the whole question of the relation of man to his sensory environment, and it bears particularly on research in personality and social processes. There are other aspects of the problem, but for those I refer you to the chapter by Thompson and myself (8) in Lindzey's *Handbook of Social Psychology*. What I want to do now is to bring the discussion closer to everyday living.

The effects I have been talking about can occur in varying degree. Lilly (13) has shown that making isolation more drastic produces motivational and emotional disturbance much more quickly; but he has also shown that the lonely man, in not too abnormal an environment otherwise, may suffer gross disturbances when the social deprivation is long continued. Lilly has reviewed some of the published reports of solitary sailors, Arctic groups in the long polar night, and shipwreck survivors in a small boat. These people, the ones who survive, develop one or other of the symptoms of the mentally ill—and among the many who do not survive, of course, there are those who develop outright psychosis. Mystical feelings of oneness with the

universe develop; fears of being insane, or of seeming to be insane, are common. In larger groups, socially closer to normal situations, Boag (3) has described a motivational process that parallels—but on a more extended scale—a puzzling aspect of results found in the McGill experiments. The experimental subjects were always eager to be tested, as a break in the monotony, and then paradoxically lacked the energy to work on problems even of moderate difficulty. Similarly, Boag reports that men in Arctic stations would make extensive plans for spare-time activities, exactly the sort of thing that would protect them against their lack of stimulation, only to slump later into a kind of apathy. There was:

... apathy, lack of interest in surroundings, motor retardation, greatly increased hours of sleep, lack of attention to personal appearance and tidiness of quarters, and disinclination to undertake extra work or odd jobs, *in spite of complaints of not having enough to do* [italics added]. An occasional man will spend a whole winter in his quarters without leaving them to visit neighbors half an hour's walk away . . . (3, p. 445).

Clearly, man's motivation is a function of his exteroceptive stimulation. I don't need to labor this further, but instead draw your attention to another set of phenomena that don't get into the books. These concern the relation of our own work habits to an accustomed environment, and the ease with which motivation is broken down. How many of you, when you get back from these meetings, will be able to go on with your work on the first day, as if you had never been away? How many of you go on vacation with plans for work that do not get carried out—that is, not even to the extent that you carry out plans when you are in your normal work environment? How many of you can write only in a particular setting, after elaborate preparation, with everything just so?

It was Karl Menninger in a personal communication who drew my attention to the similarity of the deficient-environment effects and the phenomenon of not being able to get back to work after being away—I believe it is quite common, but at any rate Menninger and I suffer from it.

Being often my own best subject when it comes to the study of abnormal behavior, I have now finally to report some peculiar behavior of my own bearing on this question of the relation of motivation to the accustomed environment. I do so with the idea that others may have observed similar

phenomena and may perhaps have better ideas as to how they are to be understood. The peculiarity, really, is only in certain time relations. I have repeatedly found, when I have been a visiting lecturer or away from my usual habitat in some other similar role, that my ability to write, or do other work that I jokingly call creative, runs down over a two-week period or thereabouts. It can be restored by a short period in my own laboratory setting, and then again runs down. This is presumably a function of homesickness, of what Hunt, I believe, called cryptic nostalgia—an acute condition, at times, from which I as well as many other persons suffer, though it is not mentioned among adults. (Rather vulgar, one gathers.) I can understand the nostalgia, in the sense that it is part of the whole picture of man's motivation as dependent on an accustomed environment, but I have more trouble understanding why the clock, so to speak, takes so long to run down. There are some problems here for research that have the happy combination of both theoretical and practical interest. I wish someone would tackle them.

REFERENCES

1. BEACH, F. A., & JAYNES, J. Effects of early experience upon the behavior of animals. *Psychol. Bull.*, 1954, 51, 239-263.
2. BEXTON, W. H., HERON, W., & SCOTT, T. H. Effects of decreased variation in the sensory environment. *Canad. J. Psychol.*, 1954, 8, 70-76.
3. BOAG, T. J. The white man in the Arctic: A preliminary study of the problems of adjustment. *Amer. J. Psychiat.*, 1952, 109, 444-449.
4. BOWLBY, J. Maternal care and mental health. *World Health Organization Monogr.*, 1951, No. 2.
5. CLARKE, R. S., HERON, W., FETHERSTONHAUGH, M. L., FORGAYS, D. G., & HEBB, D. O. Individual differences in dogs: Preliminary report on the effects of early experience. *Canad. J. Psychol.*, 1951, 5, 150-156.
6. DAVIS, K. Extreme social isolation of a child. *Amer. J. Sociol.*, 1940, 45, 554-565.
7. FORGAYS, D. G., & FORGAYS, JANET. The nature of the effect of free-environmental experience in the rat. *J. comp. physiol. Psychol.*, 1952, 45, 322-328.
8. HEBB, D. O., & THOMPSON, W. R. The social significance of animal studies. In G. Lindzey (Ed.), *Handbook of social psychology*. Cambridge, Mass.: Addison-Wesley, 1954.
9. HERON, W. The pathology of boredom. *Sci. Amer.*, 1957, 196, No. 1, 52-56.
10. HERON, W., DOANE, B. K., & SCOTT, T. H. Visual disturbances after prolonged perceptual isolation. *Canad. J. Psychol.*, 1956, 10, 13-18.

11. HILL, J. C., & ROBINSON, B. A case of retarded mental development associated with restricted movement in infancy. *Brit. J. med. Psychol.*, 1929, 9, 268-277.
12. HYMOVITCH, B. The effects of experiential variations on problem-solving in the rat. *J. comp. physiol. Psychol.*, 1952, 45, 313-321.
13. LILLY, J. C. Mental effects of reduction of ordinary levels of physical stimuli on intact, healthy persons. *Psychiat. res. Reports*, 1956, No. 5.
14. MAHUT, HELEN. Breed differences in the dog's emotional behavior. *Canad. J. Psychol.*, in press.
15. MASON, MARIE K. Learning to speak after six and one-half years of silence. *J. speech Disorders*, 1942, 7, 295-304.
16. MELZACK, R. The genesis of emotional behavior: An experimental study of the dog. *J. comp. physiol. Psychol.*, 1954, 47, 166-168.
17. MELZACK, R., & SCOTT, T. H. The effects of early experience on the response to pain. *J. comp. physiol. Psychol.*, 1957, 50, 155-161.
18. MELZACK, R., & THOMPSON, W. R. Effects of early experience on social behavior. *Canad. J. Psychol.*, 1956, 10, 82-90.
19. SPITZ, R. A. Hospitalism: A follow-up report. *Psychoanal. Study of the Child*, 1946, 2, 113-117.
20. THOMPSON, W. R., & HERON, W. The effects of restricting early experience on the problem-solving capacity of dogs. *Canad. J. Psychol.*, 1954, 8, 17-31.
21. THOMPSON, W. R., & HERON, W. The effects of early restriction on activity in dogs. *J. comp. physiol. Psychol.*, 1954, 47, 77-82.
22. THOMPSON, W. R., & MELZACK, R. Early environment. *Sci. Amer.*, 1956, 194, No. 1, 38-42.
23. THOMPSON, W. R., MELZACK, R., & SCOTT, T. H. "Whirling behavior" in dogs as related to early experience. *Science*, 1956, 123, 939.

APPLICANTS FOR FELLOW STATUS: 1959

Listed below are the names of 149 Members of the APA who are applying for Fellow status, together with the names of the divisions (in italics) through which they are applying. The list is printed here in accordance with Council action of September 1952 revising procedures for Fellow applicants.

No action has been taken on these applications by the divisions, nor by the APA Membership Committee.

All of these applicants are applying for Fellow status for the first time through the indicated divisions. Not included on this list are persons already Fellows in the APA who may be applying for Fellow status in additional divisions, nor persons whose names have been previously published as applicants.

It is from this list (plus certain applicants who are reapplying) that the divisions will make their nominations. By August 1, 1958, each division will submit its preliminary nominations. At the APA Annual Convention in September 1958, each division will submit its final list of nominees after the

divisional business meetings. These final nominations, together with recommendations from the APA Membership Committee, will be considered by the Board of Directors; and a list of Members recommended for transfer to Fellow status will then go from the Board to the Council of Representatives for vote. Fellow status for those elected will become effective January 1, 1959.

The deadline for filing applications with the APA Central Office was January 1, 1958 for applicants who wished consideration at the September 1958 Annual Meeting. The deadline for those wishing consideration at the September 1959 meeting will be January 1, 1959. By that date, applicants will need to file with the APA Central Office (addressed to the attention of the Membership Committee) one copy of the Uniform Fellow Blank for each division through which they are applying. The necessary blanks and instructions should be obtained from the appropriate division secretary (listed on the inside back cover of the November 1957 *American Psychologist*).

- | | |
|--|--|
| Alexander, Robert Harold, <i>School</i> | Dittmann, Allen T., <i>Clinical</i> |
| Arnholter, Ethlewyne G., <i>School</i> | Dudek, Edmund Emil, <i>Industrial and Business</i> |
| Arnoult, Malcolm Douglas, <i>Experimental</i> | Eaton, Dorothy M., <i>School</i> |
| Asthana, Hari Shanker, <i>Personality and Social</i> | Elkin, Victor Benjamin, <i>School</i> |
| Barron, Jules, <i>Clinical</i> | Ellingson, Robert James, <i>Experimental</i> |
| Bauman, Gerald, <i>Clinical</i> | Elliott, Carl Hartley, <i>Industrial and Business</i> |
| Bell, Richard Q., <i>Developmental</i> | Fielding, Benjamin Blumenfeld, <i>Clinical</i> |
| Berg, Paul Conrad, <i>School</i> | Fils, David H., <i>School</i> |
| Bilodeau, Edward Alfred, <i>Experimental</i> | Flemming, Edward Lee, <i>School</i> |
| Blechner, Janet Eliscu, <i>School</i> | French, Edward L., <i>School</i> |
| Boland, Ruth F., <i>School</i> | Gekoski, Norman, <i>Industrial and Business</i> |
| Borgatta, Edgar F., <i>Personality and Social</i> | Glasner, Samuel, <i>SPSSI, Counseling</i> |
| Botwinick, Jack, <i>Maturity and Old Age</i> | Gobetz, Wallace, <i>Counseling</i> |
| Bowman, Douglas James, <i>School</i> | Goodman, Morris, <i>Clinical</i> |
| Brown, Manuel Nicholas, <i>Counseling</i> | Gordon, Leonard Victor, <i>Evaluation and Measurement, Industrial and Business</i> |
| Bruce, Martin Marc, <i>Industrial and Business</i> | Gordon, Mordecai Henry, <i>Evaluation and Measurement, Clinical</i> |
| Caldwell, Willard Edmund, <i>General</i> | Green, Bert Franklin, Jr., <i>Experimental, Evaluation and Measurement</i> |
| Campbell, Joel T., <i>Industrial and Business</i> | Grossack, Martin Myer, <i>SPSSI</i> |
| Cantoni, Louis Joseph, <i>Industrial and Business, Educational, Counseling</i> | Grossman, Jules Bernard, <i>Clinical</i> |
| Carpenter, Lewis Gibbs, Jr., <i>Clinical</i> | Hammer, Emanuel F., <i>Clinical</i> |
| Carr, Edward R., <i>Industrial and Business</i> | Hammond, Kenneth Robert, <i>Personality and Social, SPSSI</i> |
| Claytor, Mae Belle, <i>SPSSI</i> | Harding, George F., <i>Clinical</i> |
| Cohen, David (Coatesville), <i>Clinical</i> | Harris, Virginia N., <i>School</i> |
| Condon, Margaret Elizabeth, <i>Counseling</i> | Haselkorn, Harry, <i>Counseling</i> |
| Courtney, Douglas, <i>Industrial and Business</i> | Hearn, Gordon, <i>SPSSI</i> |
| Crawford, Ronald Eugene, <i>School</i> | Helfant, Kenneth, <i>School</i> |
| Daniels, Harry Waller, <i>Industrial and Business</i> | |
| Derner, Gordon Frederick, <i>Clinical</i> | |

- Hertzka, Alfred Felix, *Evaluation and Measurement*
Hewitt, Benjamin A., *Counseling*
Hill, Charles Wadsworth, *Military*
Hodges, Allen, *School*
Hogan, Richard Allen, *Clinical*
Holzman, Philip S., *Clinical*
Howard, Alvin Ray, *Clinical*
Hybl, Anthony Robert, *Clinical*
Jeffrey, Wendell Everett, *Experimental, Developmental*
Jenkins, David Hibbs, *Personality and Social, SPSSI, Educational*
Jennings, Helen Hall, *SPSSI*
Jones, R. Stewart, *Educational*
Junken, Elizabeth M., *Counseling*
Karson, Samuel, *Clinical*
Keston, Morton J., *Esthetics*
Kiell, Norman, *Counseling*
Kogan, Leonard Saul, *Evaluation and Measurement*
Kogan, William Sanford, *Clinical*
Kornreich, Melvin, *Clinical*
Kovnar, Murray R., *Evaluation and Measurement, Counseling*
Krugman, Herbert Ellis, *Industrial and Business*
Kutner, Bernard, *SPSSI*
Lasko, Alvin A., *Clinical*
Lawrence, Douglas Howard, *Experimental*
Leiman, John Melvin, *Evaluation and Measurement*
Lennon, Roger Thomas, *Evaluation and Measurement*
Levine, Louis Samuel, *Clinical*
Levitt, Eugene E., *Developmental, Personality and Social, SPSSI*
Linton, Harriet B., *SPSSI*
Logan, Frank Anderson, *Experimental*
Lotsof, Erwin J., *Clinical*
Macvaugh, Gilbert Stillman, *School*
Mahler, Walter Robert, *Industrial and Business*
Malpass, Leslie F., *Clinical*
Martire, John George, *Clinical*
Matarazzo, Joseph D., *Experimental, Clinical*
McCullough, Milton William, *Public Service*
McLaughlin, Louise E., *Personality and Social*
Meredith, Cameron William, *Educational*
Merrill, Reed Miller, *Counseling*
Michaux, William Whitehead, *Clinical*
Miller, Mungo Fraser, *Personality and Social, SPSSI, Counseling*
Moldawsky, Stanley, *Clinical*
Mosak, Harold H., *Clinical*
Moynihan, James F., *Counseling*
O'Connor, Donald R., *Clinical*
Page, Horace Allen, *Clinical*
Pasternack, Ruth Simon, *School*
Platt, Henry, *School*
Powell, Marvin, *Developmental*
Powers, Joanne Ellen, *Clinical*
Raskin, Nathaniel J., *Clinical*
Rathfelder, Rollo Ray, *Industrial and Business*
Reed, Harold James, *Educational, School*
Reuder, Mary Eileen, *General*
Rigby, Wilbur K., *Clinical*
Rigney, Margaret Gardiner, *Developmental*
Roach, James H. L., *Personality and Social*
Ross, Josephine Hinman, *Clinical, Counseling*
Rubin, Leonard S., *Experimental, Military*
Rubinstein, Eli A., *Clinical*
Salzberg, Theodore Herbert, *Counseling*
Sanders, Merritt William, *Educational*
Schlosser, John Rolland, *Maturity and Old Age*
Schoepp, Aileen, *Educational*
Schultz, Karl Victor, *Counseling*
Seashore, Stanley Emanuel, *Industrial and Business*
Sebald, Dorothy Davis, *School*
Secord, Paul F., *Personality and Social*
Shatin, Leo, *Clinical*
Shrewsbury, Thomas B., *Counseling*
Simon, Ralph, *Clinical*
Sivers, William Albert, *School*
Sorsby, Felman Bascom, *Clinical*
Sperling, Philip I., *Military*
Stewart, Lawrence H., *Counseling*
Taffel, Charles, *Clinical*
Taylor, Janet Allison, *Experimental*
Tindall, Ralph H., *School*
Treverton, William Montgomery, *School*
Trumbull, Richard, *Military*
Tupes, Ernest Cook, *Evaluation and Measurement*
Veniar, Florence Abt, *Experimental*
Wagenheim, Lillian Engel, *Developmental*
Warner, Samuel Joseph, *Clinical*
Wasserman, Hilton N., *Evaluation and Measurement, Industrial and Business, Counseling*
Webster, A. Stanley, *Clinical*
Weinstein, Sidney, *Experimental*
Wenar, Charles, *Clinical*
Wenzel, Bernice Martha, *Experimental*
Wilson, Phyllis Collins, *Counseling*
Winne, John F., *Evaluation and Measurement, Personality and Social*
Wispe, Lauren G., *SPSSI*
Wolff, Wirt M., *Clinical, Counseling*
Zimmer, Herbert, *Personality and Social*

Comment

University Psychology Students Having Had Psychology in High School

Does a high school course in psychology influence students to take further work in the subject? Is high school psychology of assistance to those who take psychology in a university?

In an attempt to answer these questions, 13 university departments of psychology (Denver, Florida State, Indiana, Iowa, Kentucky, Missouri, North Carolina, North Dakota, Oklahoma, Purdue, Southern California, Texas, Vermont) were contacted and asked to administer a very short questionnaire to students in their introductory courses who had had a course in psychology in high school. The questionnaire was administered near the close of the first semester of the 1956-57 academic year. In addition, the departments furnished final course marks for their introductory students. This survey was made as part of the work of the Division 2 Committee on High School Psychology.

Of 4,695 students in 74 classes under 50 instructors, 448 (9.5%) had had a course in psychology in high school. Of this number, 345 (77.0%) had had a one-semester course, 103 (23.0%) had had a two-semester course. There were 190 men and 258 women, mostly freshmen or sophomores.

To the question:

Was your high school course in psychology the primary influence which led you to sign up for an introductory course in psychology in the university?

178 students (39.7%) replied in the affirmative. Furthermore, some who responded by "No" or "?" wrote in the explanation that psychology was a required course for them so they did not consider high school psychology as the primary influence, although it had influenced them. A breakdown of the above figure revealed that there is a significant difference between the percentages of affirmative responses given by those who had had a one-semester course in high school (34.5%) and those who had had a two-semester course (57.3%). For this question, and all others, the difference between responses of men and women was found not to be significant.

Did your high school course in psychology give you the correct impression of psychology as you have come to know psychology in your university course?

To this question, 246 students (54.9%) responded in the affirmative. The difference between those who had had a one-semester course (55.7%) and those who had had a two-semester course (52.4%) is not significant.

As related to your university work in psychology, has your high school course in psychology been (a) of assistance, (b) neither of assistance nor a handicap, (c) a handicap?

Of the 445 students who answered this question, 218 (49.0%) expressed the opinion that high school psychology had been of assistance to them in their university course, 219 (49.2%) said it had been neither of assistance nor a handicap, and only eight (1.8%) said it had been a handicap. Of the students who had had a one-semester course in high school, 45.8% thought it had been of assistance; of those who had had a two-semester course in high school, 59.8% thought it had been of assistance. The difference is significant at almost the 1% level.

It is of special interest to note that, of the 246 students who reported that high school psychology had given them the correct impression of psychology, 165 (67.1%) expressed the opinion that their high school course had been of assistance in their university course. On the other hand, of the 199 students who believed they had not been given the correct impression of psychology, only 52 (26.1%) expressed the opinion that their high school course had been of assistance in their university course. The difference is significant. For those believing they had been given the correct impression, and that they had been assisted, the difference between those having had a one-semester course (65.6%) and those having had a two-semester course (72.2%) is not significant. On the other hand, for those believing they had not been given the correct impression, but nevertheless had been assisted in their university course, the difference in favor of a two-semester course is statistically significant (45.8% as compared to 19.9%).

Final course marks for students having had psychology in high school were compared with final course marks for 3,836 students in the same classes who had not had psychology in high school. (Marks were not available for all students.) Each university used a five-letter marking system, usually *A, B, C, D, F*. The letter marks were weighted from +3 for *A* to -1 for *F*. For students not having had psychology in high school, the mean weighted mark was 1.14; for those having had either a one- or two-semester course in high school, the mean weighted mark was 1.15. The difference is not significant. Neither is there a significant difference between the mean mark of those having had a one-semester course in high school (1.18) and the mean mark of those having had a two-semester course (1.06). The difference between the mean mark for men having had psychology in high school (1.09) and for women

having had psychology in high school (1.21) is not significant. For students believing their high school course had been of assistance in their university course, the mean mark was 1.33; for those believing it had not been of assistance, 1.00. The difference is significant.

In addition to the measures of attitudes and marks, students were given an opportunity to make comments about their high school psychology course as compared to their university course. A few representative responses were as follows:

High school psychology wasn't as detailed as college psychology.

Not enough stress in high school on pure psychology.

In high school we just skipped over what seems to me now as important.

I found high school psychology to be more practical, placing the emphasis on human beings instead of white rats.

High school psychology was just as comprehensive and as well conducted as in the university. However, it lacked a laboratory.

I think college freshmen ought to be allowed to take an advance credit test if they have had high school psychology.

No attempt has been made to answer the question, "Should high school psychology be taught primarily as preparation for university psychology?"

T. L. ENGLE
Indiana University

Citing "Nonprofessional" Assistance in Published Research

The practice of employing undergraduate students and other "nonprofessional" personnel to perform the so-called *routine* work of experimentation is becoming increasingly prevalent in research circles. Beyond the initial judgmental question of whether such individuals should be employed in this capacity is the question of whether or not such assistance need be reported in the published research and, if so, in what manner their efforts should be cited.

The authors of *Ethical Standards of Psychologists* anticipated this problem, in part at least, in the section on "Ethical Standards In Writing and Publishing." Several principles are stated which touch upon this matter. A general statement of this situation is:

Credit should be assigned to all those who have contributed to a publication, in proportion to their contributions, and only to these; and the nature of the contribution (e.g., research design, collection of data, writing) should be made clear.

In outlining specific situations, the manual goes on to point out that:

... extensive clerical or similar non-professional assistance should be acknowledged in footnotes or in allocations of

credit in an introductory statement. *Paid clerical assistants on routine work need not be acknowledged.*

Two points seem significant here: (a) the concept of what constitutes routine work seems to vary widely from researcher to researcher, and (b) no statement in the *Ethical Standards* implies that such assistance shall not be noted. Considerable freedom is given the individual investigator in such situations to decide if some form of notation will be made in the published research as to the person or persons involved in such work.

In order to secure the opinions of a diversified group of researchers with regard to their handling of such matters, a questionnaire describing a specific research situation was sent to 100 members of Division 3 of the APA. All recipients of the questionnaire were selected at random from the Fellows of that division. The problem was stated as follows:

The practice of employing undergraduate students to do the routine work of experiments is becoming increasingly prevalent. Suppose that an undergraduate student has been hired at a fair hourly wage to run Ss in a research problem which has been completely set up for him with regard to Ss, task, instructions, etc. His contribution is to run the Ss and record the scores. He has no part in the planning, analysis, or reporting of the research. *Question: If you were in charge of this study and planned to publish it, would you acknowledge the student's assistance at any place in the article*

- | | |
|------------------------------------|----------|
| (a) If he were in psychology? | Yes— No— |
| If yes, how? | |
| (b) If he were outside psychology? | Yes— No— |
| If yes, how? | |

Fifty of the questionnaires contained the question as stated above. The other 50 had a similar question which was: "... *should the student's assistance be acknowledged at any place in the article. . .*" Seventy-two recipients of the questionnaire responded with the enclosed preaddressed card. Thirteen of these cards were eliminated because they (a) stated that this individual's services should be acknowledged, but failed to indicate how; (b) gave responses of an unclassifiable nature; and (c) failed to give any response, but avoided the question by various comments.

Of the remaining 59 replies, 26 (44%) stated that under the conditions outlined in the situation, they would not give credit to the student running the Ss, whether he were in psychology or some other field. Thirty-two (54%) indicated they would credit the undergraduate regardless of his area of academic work. Only one response indicated he would cite the student if he were in psychology, but would not do so if he were outside psychology. A majority of the respondents indicating they would not cite the assistance of this student commented that they viewed his services as being of a strictly routine and nonprofessional nature. Sev-

eral respondents compared his services to floor sweeping, apparatus construction, and other activities not contributing in an original manner to the conducting of the experiment. A second sizeable group of responses indicated that he was being paid for his work and hence had no claim for any type of recognition. One specific response indicated that he should only be noted if his work was voluntary or for academic credit.

Three general reasons for citing the student's services appeared in the replies answering "yes" to the two questions. Foremost among these reasons was the courtesy to the student. A second grouping of affirmative replies centered about the theme of informing readers as to how the research was conducted. A final grouping of responses centered about citing undergraduate aid to increase morale and for future recruitment purposes. Two respondents stated that they felt informing the student that his services would be cited would increase his feelings of responsibility.

General unanimity prevailed as to how the services of this individual would be cited. All respondents indicating they would cite such assistance stated that they would do so in a footnote. A number of researchers indicated that, if the services of the student went beyond those outlined in the situation, in the way of taking an unusual interest in the problem, doing an outstanding job, offering criticisms and suggestions, etc., they would not hesitate to consider him for junior authorship. One respondent warily suggested that he would not hire someone who did not deserve at least a footnote!

In including two forms of question, it was felt that a discrepancy might exist between a general knowledge of how such matters *should* be handled and how they *would* be handled in a practical setting. An additional hypothesis was that fewer responses would be obtained from the recipients of the *would* question than from the *should* question. A tabulation of the replies revealed the following:

	yes	no
should	16	15
would	16	11

Analysis of the returns indicated no significant differences between the number of *would* and *should* replying, and in the breakdown of affirmative and negative answers within these groups.

The present questionnaire was not intended to serve as a basis for coming up with some rigid rule of thumb for citing nonprofessional help—in this case, undergraduates in research. However, the reactions of a sophisticated group of experimentalists to a specific situation were viewed as of interest. It is felt that this situation is characteristic of a considerable amount of research being carried on at the present time, and the results of

the questionnaire study presented herein may be of some value to the researcher who is attempting to decide whether or not he will cite such "nonprofessional" assistance. It is of interest to note, in concluding, that only a single respondent stated he would not utilize the assistance of undergraduate personnel in conducting investigations.

CHARLES D. BARNETT
Pineville, Louisiana

Some Aspects of the Positive Value of Hostility¹

In the study of pathological behavior, it is customary to study symptoms from the viewpoint of economics: what is the tension-reduction purpose they serve? In terms of this well established tendency, it is somewhat strange that one major symptom, which we view as pathological, has not been widely explored from this standpoint. This symptom, possibly the most common one we observe, is interpersonal hostility. A brief discussion of some of the tension-reduction aspects of hostility (literally of its *positive value* to the individual) may be productive.

Examined from this standpoint, interpersonal hostility quickly reveals itself to be, among other things, an effective technique for solving relationship needs.² It is a way of bringing human beings closer together. The apparently paradoxical nature of this statement can be resolved by some concrete illustrations:

1. In the behavior of children, we frequently observe their apparent awareness that hostility *per se* is a *relationship* and is far preferable to no relationship. The child who feels psychologically isolated from a parent will often goad that parent to anger; the anger of the parent reinforces a sense of involvement for the child—he feels "your punishment shows that you are concerned and interested in me. This is bearable even though it brings pain. It is better than no sign of interest." As Phyllis McGinley has put it:

"Sticks and Stones can break the bones
When thrown with angry art.
Words can sting like anything
But silence breaks the heart" (5).

2. A colloquial New York phrase goes: "On Broadway, friends are acquaintances who have the same enemies." This appears to illustrate another function of hostility, that of binding a group more closely together by means of the stimulus of an enemy. Focusing the group on an outside threat makes each member of the group more important and needed. The loosely knit association in which one has partial membership becomes, in the face of an enemy, a tightly knit organization in which one is recognized as a comrade—

¹ This paper was written under the auspices of a grant from the Ayer Foundation, Inc.

² The strength of hostility as a relationship has probably been most clearly presented by Strindberg. His plays show how loneliness can be solved by the hatred which binds people together.

in-arms, a desperately needed, organic part of the whole. In addition, an outside enemy drains off disruptive tensions within the group and so permits the group to be more tightly bound.

An examination of the effects of psychological isolation can lead to another aspect of the value of interpersonal hostility to the individual. Emile Durckheim, in his classic study of suicide, pointed out that socioeconomic conditions which increase a sense of isolation (i.e., which tend to disrupt primary groups) increased the suicide rate (1). Thomas Fansler demonstrated that these same economic conditions increased the accident rate (unpublished manuscript). Clinical observation of the self-destructive individuals to whom we have access (the accident prone, the polysurgical addict, the alcoholic, the drug addict, etc.) shows that the single factor they appear to have in common is their lack of strong, personally acceptable relationships, their inner feelings of isolation and alienation. There appears to be strong evidence that psychological isolation has a tendency to bring self-destructive forces into play.³ Interpersonal hostility can thus serve an individual who is psychologically isolated and perceives no personally acceptable way to achieve nonhostile relationships. He can reduce the self-destructive forces operating within himself by establishing and maintaining hostile relationships to others.

There is a strong, aggressive component in all rebellion. Hostility is a valuable lever to help the individual break free of both physical and ideational restriction.

³ "All that is living must be loving, so as not to die" (2, p. 130). It may also be of interest to note that one group has been reported which apparently has very little overt self-destructive activity. This is the group of "safety-prones," individuals with an abnormally low accident rate. This group is characterized by very warm and meaningful interpersonal relationships (3, 4).

It can have great tension-reduction value. Rebellion can be a means of freeing the human spirit and a source of much of the creativity in art, science, and human relations. Robert Lindner, in his *Prescription for Rebellion* (4) has discussed this aspect in detail.

Certain other uses of hostility to reduce tension appear to be commonly used and have been widely reported. The psychodynamics of projection and reaction formation in particular may include intense outwardly directed hostility to prevent the emergence of painful self-awareness:

"Shame to him whose cruel striking
Kills for faults of his own liking."

(Measure for Measure, Act 3, Scene 2.)

It is not the purpose here to explore the problem of hostility in any detail. Rather, it is to suggest an approach: that interpersonal hostility, which as behavioral scientists we find so difficult to understand, be studied from the standpoint of the inner economics of the individual. Perhaps greater understanding of this problem can lead to more constructive methods of fulfilling the needs that are so often satisfied in ways which may be personally or socially destructive.

REFERENCES

1. DURCKHEIM, E. *Suicide: A study in sociology*. Glencoe, Ill.: Free Press, 1951.
2. FEDERN, P. The reality of the death instinct, especially in melancholia. *Psychoanal. Rev.*, 1932, 19, 129-151.
3. LESHAN, L. The safety-prone: An approach to the accident-free person. *Psychiatry*, 1952, 15, 465-468.
4. LINDNER, R. *Prescription for rebellion*. London: U. Gollancz, 1953.
5. MCGINLEY, PHYLLIS. *The love letters of Phyllis McGinley*. New York: Viking, 1954.

LAWRENCE LESHAN

Institute of Applied Biology, New York

Psychology in Action

A CENTURY OF MEDICAL TREATMENT AT STATE HOSPITAL NO. 1 AN HISTORICAL PERSPECTIVE

JOSEPH D. WARNER AND C. SCOTT MOSS

Fulton, Missouri

STATE Hospital No. 1 in Fulton, Missouri, is 106 years of age. Since some of the earliest records are still available, including social histories, diagnostic impressions, and treatment procedures, this presented an excellent opportunity to contrast the medical philosophy and treatment of mental disorders in one institution over a one-hundred-year period.

THEN AND NOW

Initially, attention was focused on a comparison of the character of psychiatric disorders during this span. Interesting differences began to appear early in the study. A most obvious difference, for example, was that in the first years only 4% of the admissions were 60 years of age or older. Nevertheless, married patients had an average of 3.8 children as opposed to only 2.2 for those in a later period (1951-1954).

Between 1852 and 1870, there were 383 deaths out of a total patient population of 1,969. As would be anticipated only 2.3% died from disorders of old age, while 21% died of "maniacal exhaustion," 13% of phthisis (tuberculosis), and 12% of epileptic convulsions. In the later group, there were 699 deaths out of a total population of 4,476: 50% died of disorders associated with old age (primarily senility or cerebral arteriosclerosis), while less than 4% died of epilepsy or pulmonary tuberculosis, and less than 3% of so-called maniacal exhaustion.

A striking similarity was found, however, in symptomatology. For instance, delusions occurred with great frequency in both groups, though the content differed markedly. That is, individuals in the early period tended to think of themselves as, say, Henry Clay, and ideas of influence and control were attributed to spirits rather than yet-to-be-invented electronic devices. Another interesting statistic was that the per diem cost of patient care was 13¢ in 1853; nevertheless, even as today, the hospital was in financial difficulty, and the legislature was generally unresponsive to the Superintendent's budgetary requests.

The most fascinating observations had to do with the treatment methods employed during this early period.

The most common techniques were bloodletting (sometimes up to three pints), the application of blistering and setons (insertions of threads) to the back of the neck, and the use of cathartics and emetics. The most common drugs prescribed during this period were quinine and iron (apparently as an appetizer), blue Mass Pills (a mercury compound commonly used in venereal diseases), Dover Pills (for cold symptoms), calomel, and morphine.

A question as to the rationale for these methods next led to an exploration of the philosophy of insanity prevalent at the time. The first Superintendent's Annual Reports to the legislature made it clear that treatment practices were based upon a firm belief in the physical etiology of mental illness. To quote from an early report:

Insanity is a departure from the healthy functions of the brain dependent upon a change in its physical structure or in the supply of blood which nourishes it. Strictly speaking, there can be no disease of the mind since this would be opposed to the teachings of the Christian faith.

This conception led directly to the supposed causes of mental illness:

The immediate or direct causes of mental aberrations are always within the system and begin or end in the brain."

These were thought to include brain injury, tumors, inflammation, fever, "irritation of the nervous system transmitted through nervous communication to the brain (infection from toothache or a rusty nail)," poisons (such as addiction to alcohol, tobacco, or opium), and assimilation of nature's secretions through diseases of vital organs. The greatest single cause of insanity was considered to be "hereditary transmission of constitutional defects." Alcohol, "the ablest ally of the devil," and masturbation were singled out as primary causes among males, while puerperal or "childbirth" fever was considered a highly important cause among females.

In spite of this emphasis on physical causation, however, there was frequent and puzzling mention of so-

called "moral treatment" in these early reports which appeared to be quite incongruent with the prevailing medical philosophy. To illustrate, the same report quoted above also stated:

The law of kindness should be the governing one in this situation. Those who do not at heart adopt this sentiment are unfit to take charge of patients and are not wanted here.

Employees were admonished to encourage and inspire patients with the good will of the physician and the prescribed treatment—in short, "to assure him that he was among friends." It was emphasized that a patient should never be deceived, that candor and frankness were absolutely necessary in relating to patients, and that a consistent, mild, friendly, unobtrusive attempt should be made to orient the patient to reality. The attendants were explicitly instructed that they must never mock, ridicule, or imitate the patient, but must consistently evidence kindness, good will, sincere interest, and sympathy. Abuse of the patient was regarded as a cause for immediate dismissal. "A single word aptly spoken will sometimes prove a turning point in a case." The Superintendent's reports also advocated amusement, recognized the soothing effect of music and the importance of a patient library, encouraged religious exercises, commented upon the salutary effect of exercise, labor, and rest, and recognized the need for cheerful, pleasant surroundings.

TREATMENT PROCEDURES

At this juncture, there was need to put these facts into a historical frame of reference in which, perhaps, these seeming inconsistencies might be reconciled. Further library research revealed that treatment at Fulton was not particularly inconsistent with treatment elsewhere. The same schism between physical and "moral" treatment existed in psychiatry in general. The most prominent psychiatrists of that time (Woodward, Brigham, Kirkbride, et al.) put principal emphasis on the physical nature and treatment of the insane. The medical treatment generally advocated was the so-called "depletion method," consisting mainly of bleeding and purging. The main value of these rather drastic techniques seems to have been in their exhausting effects and the reduction of violent symptoms.

Yet, in the same era, voices were raised which sound very modern indeed! A new social consciousness at the end of the eighteenth century resulted in a humanitarian approach to the care of the mentally disordered, advocating treatment methods that are only now being rediscovered. Thus, many of these individuals emphasized the benefits to the patient derived from the "proper" environs and the "correct" attitudes of hospital personnel. As early as 1818, there is this remarkable statement by Neumann:

It is high time that we should cease the search for the herb or the salt or the metal . . . which will cure mania, deterioration, delusions or excitement. It will not be found any sooner than one will find pills which will make a great artist out of an ignorant lout or a well behaved child out of a spoiled one.¹

Records reveal that during the period 1951-1954 the primary treatment procedures in this hospital for all patients diagnosed with a functional psychotic disorder were still of a physical nature, namely, insulin and electroshock therapy and hydrotherapy. A small occupational therapy unit was also given passing reference. A quote from the Superintendent's Annual Report²

It is only through exhaustive laboratory studies that a proper evaluation of each case is made, by means of which we should be able in time to carry on investigative research studies, with the sole purpose in mind of exhausting all available facilities in attempting to determine some of the factors which we do not understand and which lead to some of the functional disorders, and for which we realize that we do not have the final answer as to the definite treatment procedure.

In conformity with this attitude, each patient upon entering received a thorough physical, neurological, and laboratory work-up, but without isolating the biochemical agents assumed to underlie these disorders.

The attempt was again made to view the treatment procedures at this institution in the context of the times. A somewhat greater recognition of the importance of psychogenic factors in mental illness than had previously existed was found. Generally, however, despite the widespread influence of psychoanalysis, the majority of the medical profession still sought an answer to the etiology of psychosis in some impairment or defect in the structure of the nervous system or those elements which maintain its normal metabolism. Examination of the most commonly used procedures in the treatment of psychosis as set forth in authoritative and representative texts reflects the emphasis on physical etiology. Electroshock and various forms of sedation are generally given considerable space, while psychotherapy is suggested merely as an adjunct, although in mild cases it was recognized as having considerable value. It seemed that the schism in the medical personality between physical and moral (psychotherapeutic) conceptions remained relatively unintegrated.

THE PURELY PHYSICAL

Thus the history of medical treatment testifies to the ardent quest for a simple, quick, physical cure of men-

¹ E. KRAEPLIN. *Hundert Jahre Psychiatric*. Berlin: Springer, 1918.

² Division of Mental Disease, State of Missouri, 1952-1953. aptly characterizes the philosophy of treatment in this institution during this period.

tal disorders. Evidence of a definite predisposition is apparent in the fact that in the mind of the medical profession mental disorders became a purely physical disease long before it had the slightest conception of the anatomy of the brain or of the physiology of the glands of internal secretion.

The historical explanation lies partly in that, unwilling to leave the treatment of mental disturbances in the hands of theology, medicine initially found it necessary to define itself into the field by ascribing to such disorders a physical and naturalistic explanation. It was only reasonable that they should expect that the methods of medicine which were becoming increasingly successful in conquering physical illness would succeed in this area too. Failure to achieve the desired results did not alter this faith nor appreciably reduce their resistance to dynamic psychiatry, but did force them to constantly justify their conviction rather than seek a new solution to the problem: mental disorders must have a physical cause and cure in order that traditional medical practice be applicable. At the same time, the need for the "magic pill" that Neumann decried was reinforced by a feeling of "copelessness" in dealing with the problem in the conventional medical fashion. The intense frustration of the invariably overworked physician in the psychiatric institution was reflected in the need for a simple answer to an overwhelmingly complex and pressing problem.

Two major trends are discernible at the moment in the institutional treatment of mental patients both at this hospital and throughout the country. First, there are the new discoveries in chemotherapy which are proving effective in reducing tension and anxiety even in chronically disturbed patients. They act to relax the anxious person and enable him to deal more objectively with a stressful situation. As such, these drugs are not a cure, since obviously they can tranquilize but not re-socialize; however, they may provide increased accessibility to psychotherapy and other re-educative efforts. The second important trend is a growing interest in the rediscovery of the hospital as a therapeutic community. This is the conception of emotional and mental disorders as the result of learned behavior patterns and the basic treatment one of providing the patient with corrective emotional experiences based on a calculated use of interpersonal relations.

As is now apparent, these two approaches are the natural culmination of dual trends which have existed in American psychiatry for over a century. It is to be hoped that a level of maturity is approaching at which the physician and the social scientist can bury their personal and professional differences in a mutual concern for the welfare of the patient and thereby effect a reconciliation and integration within the medical personality which could initiate a new and hopeful era in the treatment of mental disorders.

Psychology in the News

Another Form of Psi in Sky . . .

"Navy Tests Due to Put Strange Lights in Sky" was the headline. While the national capital is still suffering from sputnik jitters, another kind of sky watching took place, as described in a recent news story. The Navy was testing a new kind of lighting system, to make planes more visible against varying backgrounds. The lights were to be tested on this occasion by one plane flying against a background of city lights in Washington and Baltimore, while another plane followed to make observations. The pilots in the second plane would react and—you guessed it—psychologists aboard would react to the reactions. The Applied Psychology Corporation of Arlington was at work, for the Navy.

How to Introduce the Psychologist . . .

The January *Journal of the National Education Association* has an extensive article on the school child and the psychologist, written by Stanley C. Mahoney, Assistant Professor of Psychology in the Division of Education and Psychology, Kansas State College, Hays, Kansas. The main purpose of the article is to answer the question: "What do you tell the child who is about to be referred to a psychologist?" The author logically says: "it is probably best to avoid phrases or concepts which have a personal and painful meaning to the child in view of his current difficulties and past experiences. Such words as 'doctor,' 'tests,' 'examinations,' and even 'teacher' may be loaded with emotion."

Lest the teacher be left absolutely wordless, however, the author concludes: "Perhaps most im-

portant is the intangible attitude which is conveyed with the actual words."

"The Face of Crime" . . .

Many psychologists have expressed admiration for a recent CBS television hour, called "The Face of Crime," which gave an excellent idea of the purposes and methods of group therapy. It was narrated by Walter Cronkite, showed many scenes at a New Jersey reformatory, and did an excellent job of illustrating the team concept: a psychiatrist, a psychologist, and a social worker discussing a typical patient.

Without Doubt . . .

A new Code for Medical Writing has been published by the Physicians' council for Information on Child Health. The code talks of premature publicity, i.e., discussion of new agents or procedures before they are reported professionally, and other such items. It also says the general effect of the written material should be considered, i.e., whether it exhibits a sincere desire to improve the health of children, is in good taste, etc. Among other things to be considered, the code says that material intended for mass publication "should not cause parents to doubt their fitness for parenthood . . . should not serve to diminish the confidence of parents in those persons to whom the health and medical care of children is properly entrusted."

If these policies could be uniformly enforced, they would certainly result in more parenthood without a doubt.

—M. AMRINE

Psychology in the States

State Associations in Action

Maryland Psychological Association. Trying to offer a prospectus that would meet the needs of all its members while satisfying the purposes for which the association exists, the Executive Council of MPA has conceived a seven-point program. Its suggestions, seemingly adaptable to the needs of fellow state associations, include the following:

1. The association insure sponsorship of activities of interest to the nonclinician, arranging suitable joint symposia, among other things
2. Contact be established with such groups as members of the bar, county medical societies, and teachers colleges, even if only by including them on the association's newsletter mailing list
3. The association engage in community education programs, such as the teaching of psychology and the dissemination of information about psychology as a career
4. Graduate students be encouraged to participate in the activities of the association, perhaps being invited to read papers for which appropriate prizes can be offered
5. Affiliation with the Academy of Science be considered
6. A research committee be organized to gather information on such matters as sources of research funds and the availability of control groups for experimental work
7. The association promote growth among its members by arranging suitable institutes, courses, and workshops for exchange of experiences

Illinois Psychological Association. In a stepped-up campaign to catalog psychologists' activities and to make them appropriately visible, the IPA's Committee on Public and Professional Relationships has proposed a three-point program:

1. Efforts are under way to bring to county bar associations, medical societies, and social work chapters knowledge of APA's ethical standards.
2. Inventory is being taken of the diversity of psychologists. The information compiled bears upon education and training, area of specialization, current job functions, degree of independence, level of responsibility, reactions toward such matters as

standards of training and legislation governing psychologists.

3. A systematic analysis of press coverage is being attempted with reference to (a) the degree to which the research activities and psychological services of all brands of psychologists gain public attention and (b) the adequacy of the newspaper publicity accorded IPA's conventions.

* * * *

California and Certification. Having been appointed by the Governor, the Psychology Examining Committee has begun work. Its members include Hugh M. Bell, Edward M. Glaser, Norman B. Henderson, Robert G. Kaplan, Harry C. Mahan (Chairman), Ruth Palmer, and William H. Pemberton. Under way is the preparation of application forms and/or affidavits to be submitted by: (a) those who were offering their services to the public as psychologists on September 11, 1957 and who desire to continue in practice as psychologists, (b) persons who consider themselves qualified without examination, (c) people desirous of taking the "junior examination," (d) people wishing to take the certification examination.

It is anticipated that the first certification examination will be held prior to July 1, 1958. Ample time will be allowed those now in the practice of psychology to qualify for continuance in such practice under the Psychology Certification Act. On the other hand, individuals who may have entered practice since September 11, 1957 have presumably done so illegally and may not use the title "Psychologist" until certified by the committee. Persons in the latter category are urged to communicate with the Psychology Examining Committee immediately at 1020 N Street, Sacramento, making known the facts and requesting the appropriate forms and applications.

* * * *

Another County Heard From. The formation of state associations is nearing closure. All but two states are now officially affiliated with APA through CSPA, and the likelihood is good that September may find the picture complete. The Nevada Psychological Association, already organized, has pre-

sented its application for affiliation. Meanwhile organizational efforts are afoot in Wyoming as well. Less fortunately situated but equally as well motivated are some Alaskan colleagues, determined that an Alaskan Psychological Association will likewise come to pass.

Ceiling Not Zero, But Visibility Somewhat Low. At fairly regular intervals APA Central Office receives a long-distance phone call from major magazines in various cities. Frequently the request is one which can be handled by referring the writer of a prospective article to some knowledgeable psychologists in the vicinity of the magazine's headquarters. The subsequent consultation usually proves mutually satisfactory.

After a recent experience of this sort, it occurred to us that, had the magazine staff been aware that a state psychological association was around the corner, it might have turned to those good folks directly.

Constitutions and Their Revision. State Associations contemplating revision of their constitutions might do well to secure copies of Vol. 1, No. 3 of the Oklahoma State Psychological Association Newsletter. The latter presents its issues effectively while attuned to the need for promoting closer liaison among states and between the state and national levels.

Forensic Psychology. While the Durham decision appeared for a while to have helped clarify the relation between mental illness and legal culpability, recent news items indicate that the general issue is hardly resolved. Law is complicated; people no less so. By way of maintaining an enlightened attitude, the Maryland Psychological Association has for some time had a Committee on the Psychologist as Expert Witness. In a recent much publicized murder trial, several Maryland psychologists were asked to testify. It is of interest that, while the prosecuting attorney tried to have their testimony ruled out on the ground that they were not "psychiatrists," the attorney was overruled by the court and the testimony admitted. The matter was reported fairly by the newspapers and the attendant publicity proved favorable.

Board of Examiners of the New Jersey Psychological Association, Inc. The NJPA Board of Examiners announces the election of Edward

Joseph Shoben, Jr. as its Chairman. The remaining members of the board, listed in the February 1957 *American Psychologist*, continue in office.

* * * *

Mental Health Week. The tenth annual observance of Mental Health Week will take place April 27-May 3, 1958 under the direction of the National Association for Mental Health, which co-sponsors the event annually with the National Institute of Mental Health, U. S. Department of Health, Education and Welfare. The theme for 1958—"With Your Help, the Mentally Ill Can Come Back"—stresses the hopeful outlook as well as the need for citizen action. All national organizations and their local affiliates have been asked to participate in the effort.

* * * *

New State Association Officers. The following rosters have been announced:

Arkansas Psychological Association

President: Frederick Schnadt
President-elect: Robert C. Cannon
Secretary-Treasurer: George Katz

Tennessee Psychological Association

President: Julius Seeman
President-elect: Louise W. Cureton
Secretary-Treasurer: J. M. Porter, Jr.

Local Associations. The following roster of officers has been announced:

Syracuse Psychological Association

President: George G. Stern
Secretary: Sidney A. Orgel
Treasurer: LeRoy Shropshire

* * * *

State Convention Calendar

Illinois Psychological Association: April 4-5, 1958; Springfield, Illinois

For information, write to:
George S. Speer
3329 South Federal Street
Chicago 16, Illinois

North Dakota Psychological Association: April 18, 1958; Grand Forks, North Dakota

For information, write to:
James O. Whittaker
Department of Psychology
University of North Dakota
Grand Forks, North Dakota

—W. J. McKEACHIE
E. L. HOCH

Psychological Notes and News

E. Stanley Abbot, of Wayland, Massachusetts, died in October 1957.

Douglas M. Kelley, of Berkeley, California, died January 1, 1958.

George Malcolm Stratton, a past President of the APA, died October 8, 1957.

Phyllis Blanchard, formerly at the Philadelphia Child Guidance Clinic and more recently at the Delaware County Child Guidance Clinic has retired. One of her major fields of interest was the study and treatment of dynamic factors involved in remedial reading cases and recognition of the need for specific pedagogical techniques to supplement psychotherapy. Martin Kaplan replaces her as Chief Psychologist.

J. D. Brower has been appointed Personnel Manager of the Chicago Division of Lytle Engineering & Mfg. Company; he was formerly at the American Institute for Research.

Edith Obstfeld Eaton, since her recent marriage to Harold E. Eaton, is now using her married name professionally.

John C. Flanagan, President and Director of Research at the American Institute for Research, was the recipient of the first Award in Recognition of Outstanding Research Contributions to the Art and Science of Personnel Management. The citation read in part: "For his pioneering work as Director of the United States Air Force Aviation Psychology Program. . . . For his continuing contributions toward discovery, development, and effective utilization of high talent manpower for science, industry, and government."

Donald G. Forgays, formerly at Cornell University, has been appointed Assistant Professor of Psychology at Douglass College, Rutgers University.

Robert M. Gagné, formerly at the Air Force Personnel and Training Research Center, has been appointed Professor of Psychology at Princeton University.

Arthur C. F. Gilbert accepted an appointment as Assistant Director of the Counseling Service and

to the staff of the Department of Psychology at Princeton University in September. He will serve as Acting Director of the Counseling Service for the remainder of the academic year.

Frank N. Jacobson, formerly in the Mental Hygiene Clinic and Department of Psychiatry at the Ohio State University Medical School, has been appointed Director of the Community Services Section, Division of Mental Health, Idaho State Board of Health.

Roland Elliott Johnston has been appointed an Instructor in Psychology at Villanova University, replacing Louis Lepine.

Franz Samelson is now Assistant Professor of Psychology at Kansas State College; he was formerly Research Associate at the Mental Health Research Institute, University of Michigan. During the current year, Arthur Brayfield is on leave to hold a National Science Foundation Faculty Fellowship; Donald F. Showalter is Acting Chairman.

Richard S. Lazarus of the Department of Psychology, University of California, has joined the Board of Consulting Editors of the *Psychological Newsletter*.

David B. Learner is now directing a human factors research group in the Engineering Mechanics Department of the Research Staff at General Motors Corporation, Michigan.

Harold J. Leavitt has been appointed Professor of Industrial Administration and Psychology at Carnegie Institute of Technology.

Rohrer, Hibler & Replogle announces the appointment of John J. McMillan to the staff of their Atlanta office.

Robert B. Mills, formerly in the Mental Hygiene Clinic at Meadowbrook Hospital, has been appointed Chief Psychologist in the Psychiatric Clinic of the Cincinnati Municipal Court.

George Moed, formerly at the University of Pennsylvania, has been appointed Research Director at the Children's Seashore House, Atlantic City, New Jersey, to conduct a three-year study.

Charles M. Morris, formerly at Eastern Pennsylvania Psychiatric Institute, has been appointed Assistant Professor of Psychology at Lafayette College, Easton, Pennsylvania.

Paul D. Park, formerly at the Veterans Administration, and **Leonard Zuckman**, formerly at Morrisania City Hospital, have joined the staff of the Psychology Department at Elmhurst General Hospital, Queens, New York, as Chief Psychologist and Senior Psychologist.

Maxine Murphy Gunderson, **E. K. Eric Gunderson**, **Margaret Peshel**, and **John R. Peshel** have formed the Psychological Services Association in San Diego, California. **Mandel Sherman** is one of the psychiatric consultants. Maxine Gunderson has also been appointed to the faculty at the University of San Diego. Eric Gunderson has been appointed Chief Psychologist at the United States Naval Retraining Command, Camp Elliott, San Diego, replacing **J. Douglas Grant** who is now with the California State Board of Corrections.

Robert A. Schaefer, formerly Chief Psychologist at Columbus Psychiatric Clinic, has been appointed Associate Professor in the Department of Psychology at Southern Illinois University, Carbondale, Illinois.

Eduard Simson, formerly at the Alaska Department of Health regional office in Anchorage, has been transferred to the ADH Fairbanks office to establish a new community Mental Health Clinic.

Lawrence H. Tober has resigned as Director of Psychotherapy at Cleveland State Hospital to enter private practice.

The following personnel changes have occurred in Psychology Services, Department of Medicine and Surgery, Veterans Administration:

Ann K. Fitz-Hugh has transferred from the Danville VA Hospital to the staff of the Psychology Service, VA Hospital, Downey, Illinois.

Arold Golub has been appointed to the Clinical Psychology Staff, VA Hospital, Bronx, New York.

L. A. Goodrich has transferred from the Knoxville VA Hospital to the staff of the Psychology Service, Downey, Illinois.

Melvyn M. Katz has resigned from the position of Clinical Psychologist, VA Hospital, Northport, Long Island, New York.

John B. Marks is now Chief, Psychiatric Research Unit, and **James C. Stauffacher** is now Chief Clinical Psychologist, VA Hospital, American Lake, Washington.

Carl E. Morgan has transferred from the Knoxville VA Hospital to the Clinical Psychology Staff, VA Center, Des Moines, Iowa.

Zita L. Okonak, a graduate of the VA Psychology Training Program, University of Pittsburgh, has been appointed to the Psychology Staff, VA Hospital (Leech Farm Road), Pittsburgh, Pennsylvania.

Raymond Parker has been appointed to the staff of the Psychology Service, VA Hospital, Montrose, New York.

David H. Wolff, formerly with the United States Air Force, is now a clinical psychologist at the Battle Creek Child Guidance Clinic, Michigan.

The Psychological Laboratories of the Connecticut State Hospital offers a postdoctoral fellowship in clinical psychology with specialization in group psychotherapy with institutionalized patients. The fellowship is available for one or two years under a USPHS training grant and carries a tax-free stipend of \$3,400 for the first year and \$4,000 for the second year. A special faculty in group psychotherapy has been assembled specifically for this program. The program will be adapted to the individual needs of the fellow; it includes clinical as well as didactic individual and group experiences and the opportunity to engage in research. For further information, write to: **Jules D. Holzborg**, Director of Psychological Laboratories; Connecticut State Hospital; Middletown, Connecticut.

The next closing date for the receipt of proposals in the *Social Science Research Program* of the National Science Foundation is October 1, 1958. For further information, write to: **Harry Alpert**, Program Director for Social Science Research; National Science Foundation; Washington 25, D. C.

The Russell Sage Foundation offers postdoctoral residencies in operating agencies or professional schools for the purpose of providing qualified sociologists, social psychologists, and anthropologists with specialized training and experience relevant to professional practice. Applicants are eligible for consideration for appointment if they: (a) have received the doctorate or will have completed all requirements for the doctorate in sociology, social psychology, or anthropology before the date on

which the requested residency is to begin; (b) are not over 35 years of age; (c) have records which clearly indicate superior ability; and (d) are definitely interested in careers involving applications of behavioral science in a field of professional practice. Appointments are made for one year with the possibility of renewal for one additional year. Awards may be made at any time during the year. Stipends range from \$3,500 to \$5,000. Applications and requests for further information should be addressed to: Russell Sage Foundation; 505 Park Avenue; New York 22, New York.

A research fund has been established by the Des Moines chapter of the Chi Omega Sorority Alumnae to support research in child development and disorders of childhood. The fund will be administered by the Des Moines Child Guidance Center.

The Foundation for Research on Human Behavior has awarded the following research grants during the current fiscal year:

Harry Triandis, Cornell University, \$5,340 to identify categories of thought in boss-subordinate situations and to measure the difference in thought categories between pairs of individuals.

John French, Research Center for Group Dynamics, University of Michigan, \$12,000 for a controlled laboratory experiment to determine the reactions of subordinates to leadership behavior which exercises varying degrees of coercive and reward power.

Mason Haire, Psychology Department and Institute of Industrial Relations, University of California, \$19,150 for a three-year study of the growth of industrial organizations at different stages of development.

Stuart W. Cook, Research Center for Human Relations, New York University, \$13,000 to study the effects of social interaction and of training programs on foreign trainees in this country, to learn how attitudes towards Americans are developed, how stable these attitudes are, and upon what experiences attitude changes depend.

The following grants in sociology and social psychology were recently made by the **National Science Foundation** as part of its *Social Science Research Program*:

U. Bronfenbrenner, Cornell University, "Identification and Family Structure," \$9,500 for one year.

R. D. Luce, Harvard University, "Mathematics of Imperfect Discrimination," \$7,300 for one year.

C. De Soto, Johns Hopkins University, "Conceptual Learning of Relationships," \$7,100 for two years.

D. O. Price, University of North Carolina, "Computer Research in Demography," \$9,900 for one year.

The Office of Vocational Rehabilitation of the United States Department of Health, Education, and Welfare has awarded a teaching and traineeship grant to the University of Pittsburgh in the amount of \$28,728 to develop and strengthen the training program on speech and hearing disorders. The grant is under the direction of Jack Matthews.

A citizens' group of 15 persons, closely associated with behavioral science, have urged a national effort for increased research in human behavior as a means of fostering improved international relations and strengthening the national defense. The call was made in a 7,000-word statement discussing the perils of inaction in this field and outlining a series of specific recommendations for action. The statement was made public after a series of conferences with ranking federal officials. The group was organized by James G. Miller, Director of the Mental Health Research Institute at the University of Michigan.

To assist students in preparing manuscripts for journal publication, theses and dissertations, and research reports, Carl R. Oldroyd has developed a manual: *Preparation of Reports for the Psychology Department*. This manual was produced by combining the *APA Publication Manual*, 1957 Revision, with inserted supplementary material prepared by the Psychology Department at the University of Oklahoma.

David B. Ficks, Director of Industrial Relations at the C. A. Norgren Company (Englewood, Colorado), led a five-day orientation seminar for the American Management Association in New York, February 10-14, on: "Personnel Management in the Small Company or Branch Plant."

A new method to determine how much light is needed for specific working tasks was the major topic of a symposium on March 3-4 sponsored by the Illuminating Engineering Research Institute (1860 Broadway; New York 23, New York) at the Dearborn Inn, Dearborn, Michigan.

A second eight-week conference and work session sponsored by the Behavioral Science Division, Air Force Office of Scientific Research, will be held at the University of New Mexico during the summer of 1958. Persons with demonstrated ability in interdisciplinary research will engage in planning

and initiating the first phases of **behavioral sciences research** on problems of especially long-run importance to the Air Force. Correspondence should be addressed to: Ralph Norman; Department of Psychology; University of New Mexico; Albuquerque, New Mexico.

The Annual Meeting of the **Group Psychotherapy Association of Southern California** will be held May 3, 1958 in Los Angeles. For further information, write to: Lorlene Johnston; 450 North Bedford Drive; Beverly Hills, California.

The third **Ibero-American Medical-Psychological Congress** will be held August 17-23, 1958 in Rio De Janeiro, Brasil. For further information, write to: Instituto de Psiquiatria, Universidade de Brasil; Av. Wenceslau Braz, 71; Botafogo, Rio de Janeiro, Brasil.

The eighty-fifth Annual Forum of the **National Conference on Social Welfare** will be held May 11-16, 1958 in Chicago. For further information, write to: NCSW; 22 West Gay Street; Columbus 15, Ohio.

The 1958 **National Institute on Crime and Delinquency** will be held May 18-21, 1958 in Miami Beach. For further information, write to: Raymond Marsh; Parole Commission; Tallahassee, Florida.

Harvard University has announced the appointment of Donald B. Lindsley as William James Lecturer in Psychology for the fall term of 1958. The subject of the series of ten lectures is new knowledge of **neuropsychology** important for psychology and psychological theorizing.

The Department of Psychology, Springfield State Hospital announces that the Virginia Beyer Memorial Lecturer for 1958 will be Morris S. Schwartz. The topic will be "**The Mental Hospital: Institution in Transition.**" The lecture will take place on April 25. For further information, write to: Michael H. P. Finn, Chief Psychologist; Springfield State Hospital; Sykesville, Maryland.

The Committee on Diagnostic Reading Tests announces **summer workshops in reading**. For further information, write to: Committee on Diagnostic Reading Tests; Kingscote Apt. 3 G; 419 West 119 Street; New York 27, New York.

The Merrill-Palmer School announces **summer workshops** on the teaching of infant development, interpersonal relations, family life education, early childhood education, and child development. For

further information, write to: Merrill-Palmer School; 71 East Ferry Avenue; Detroit 2, Michigan.

The Claremont Summer Session and the Children's Hospital, Los Angeles, announce the 1958 **workshop in Rorschach** and other projective techniques. For further information, write to: Bruno Klopfer; P. O. Box 2971; Carmel, California.

The Department of Psychology at the University of Chicago announces that S. J. Beck will conduct two **summer Rorschach workshops**. For further information, write to: Rorschach Workshops; Department of Psychology, University of Chicago; Chicago 37, Illinois.

Acting on Stuart Cook's suggestions in his address (*Amer. Psychologist*, 1957, 12, 267-272) to the New York Society for Clinical Psychologists, a group of psychologists serving independent schools in the New York metropolitan district have formed the **Associated Psychologists of Independent Schools**. Workshops are held to discuss common interests and concerns; they provide a means of collecting information about disparate, experimental programs in which the member schools are involved. Six workshops have been held under the direction of Albert N. Berenberg (31 West 110th Street; New York 28, New York).

At the fifth Congress of the **Interamerican Society of Psychology**, held in Mexico City in December, 1957, the following were elected or designated as officers for 1958-9: Guillermo Davila (*Mexico*), President; Otto Klineberg (*United States*), Past President; Gustave M. Gilbert (*United States*), President-elect; Robert B. Malm (*Canada*), Vice-President; Harold H. Anderson (*United States*), Treasurer; Samuel Pearlman (*United States*), Executive Secretary for North American; Sara Margarita Zendejas (*Mexico*), Executive Secretary for Latin America. The associated Vice-Presidents are: Noel Mailloux, Canada; Jose Angel Bustamante, Caribbean Zone; Emilio Mira y Lopez, Brazil, Atlantic Zone; Carlos Alberto Seguin, Pacific Zone; Jose Peinado Altale, Mexico and Central America; George K. Bennett, United States. Victor M. Sanua (*United States*) will serve as Director of Publications. Inquiries relative to membership may be directed to: Samuel Pearlman; Brooklyn College; Brooklyn 10, New York.

Convention Calendar

American Psychological Association: August 28-September 3, 1958; Washington, D. C.

For information, write to:

Roderick H. Bare
American Psychological Association
1333 Sixteenth Street, N.W.
Washington 6, D. C.

Southwestern Psychological Association: April 3-5, 1958; Austin, Texas

For information, write to:

Ruth M. Hubbard
Veterans Administration Hospital
Waco, Texas

Southern Society for Philosophy and Psychology: April 4-5, 1958; Nashville, Tennessee

For information, write to:

Wilse B. Webb, Secretary
503 Bayshore Drive
Pensacola, Florida

Eastern Psychological Association: April 11-12, 1958; Philadelphia, Pennsylvania

For information, write to:

Gorham Lane
Department of Psychology
University of Delaware
Newark, Delaware

Western Psychological Association: April 24-26, 1958; Monterey, California

For information, write to:

Francis H. Palmer
U. S. Army Leadership Human Research Unit
P. O. Box 787
Presidio of Monterey, California

Southeastern Psychological Association: April 27-29, 1958; Atlanta, Georgia

For information, write to:

M. C. Langhorne
Box 2
Emory University, Georgia

Midwestern Psychological Association: May 1-3, 1958; Detroit, Michigan

For information, write to:

Donald W. Fiske, Secretary-Treasurer
Department of Psychology
University of Chicago
Chicago 37, Illinois

Rocky Mountain Psychological Association: May 8-10, 1958; Santa Fe, New Mexico

For information, write to:

William H. Brown
Department of Psychiatry
University of Utah College of Medicine
156 Westminster Avenue
Salt Lake City 15, Utah

Inter-Society Color Council, Twenty-Seventh Annual Meeting: March 25-26, 1958; Washington, D. C.

For information, write to:

Ralph M. Evans, Secretary
Inter-Society Color Council
Color Technology Division, Building 65
Eastman Kodak Company
Rochester 4, New York

World Federation for Mental Health: August 24-29, 1958; Vienna, Austria

For information, write to:

Secretary-General
World Federation for Mental Health
19 Manchester Street
London, W.1, England

A calendar of international conventions was given in the January 1958 issue of the *American Psychologist*

CURRENT INFORMATION for *Employers and Prospective Employees*

The Employment Bulletin of the APA contains a monthly listing of position vacancies, information about programs employing numbers of psychologists, and availability notices of APA members. It is designed for both employers and employees seeking qualified psychologists or appropriate positions. Clinical, academic, industrial and research listings requiring at least 1 year graduate work plus 1 year experience are published by this service. Copies are mailed on the 15th of each month, which means to assure publication in a given month, notices must be received by the 7th of that month.

EMPLOYEE NOTICES: APA members may insert an announcement of their availability by submitting a brief résumé of training and experience on a standard form which will be sent upon request. These notices, for which there is a charge of \$1.00 per insertion, are carried anonymously under box numbers.

EMPLOYER'S NOTE: Notices of position vacancies are listed without charge to non-profit organizations (profit making organizations are charged \$1.00 per notice). Employers who wish to use this service are asked to submit a brief description of the vacancy on standard forms which will be sent upon request. The employer may identify his organization and receive applications directly; or he may use a box number.

AMERICAN PSYCHOLOGICAL
ASSOCIATION

*employment
bulletin*

Volume II

1958

Complimentary copies are sent on request to university departments granting graduate degrees in psychology, and to organizations employing ten or more psychologists.

1958 SUBSCRIPTION POLICY

Subscription will begin with the January 1958 issue; or, at the expiration of your present subscription if you already receive the EMPLOYMENT BULLETIN.

PLEASE CHECK THE TYPE OF SUBSCRIPTION YOU DESIRE AND RETURN THIS SLIP WITH YOUR REMITTANCE. MAKE ALL CHECKS PAYABLE TO THE APA.

Single issue.....	\$.50
MEMBER —1 year subscription to the <i>Employment Bulletin</i>	\$3.00
—2 year subscription to the <i>Employment Bulletin</i>	\$6.00
NONMEMBER —1 year subscription to the <i>Employment Bulletin</i>	\$5.00

NAME.....

STREET.....

CITY.....ZONE.....STATE.....

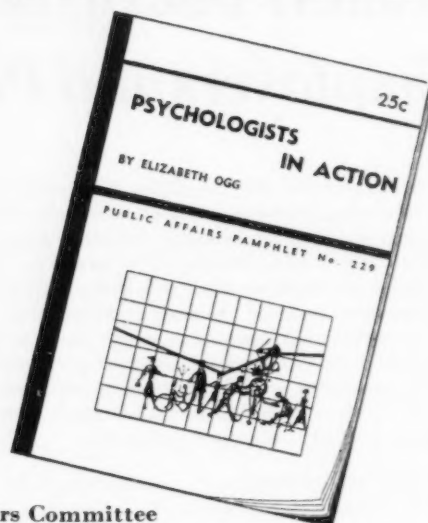
Order from:

Employment Bulletin

American Psychological Association, 1333 16th Street NW, Washington 6, D. C.

*Announcing a Public Affairs Pamphlet
for use in your community:*

"PSYCHOLOGISTS IN ACTION"



Co-sponsored by APA and Public Affairs Committee

A 28-page booklet, edited by an APA committee under Raymond Katzell, for the general purpose of informing interested persons about psychology's aims, psychologists' interests and active applications today.

It is designed to be distributed by state associations, local groups, university departments . . .

Advance orders include 20,000 for New York State, 1,000 for Michigan . . .

Psychologists can use this booklet "by way of introduction" . . .

IN CAREER GUIDANCE

To high school students or college freshmen making career decisions . . . through vocational guidance centers . . . in speeches to high school classes

IN PROFESSIONAL RELATIONS

The booklet was also designed to explain the diversity of psychology to collateral professions . . . to be sent to educators, ministers, medical societies, social workers and others

IN EMPLOYEE ORIENTATION

It is hoped this booklet can be useful to research groups or government agencies, as a handbook showing non-professional people the kinds of things psychologists do . . .

ORDER

"PSYCHOLOGISTS IN ACTION"

at these rates in bulk:

15¢ each for 1 to 99 copies

12¢ each for 100 or more copies

COUPON

**PUBLIC INFORMATION, APA
1333 Sixteenth Street, N. W.
Washington 6, D. C.**

Send copies of
"PSYCHOLOGISTS IN ACTION" to:

Name:.....

Street:.....

City:.....

State:.....

Produced by the Public Affairs Committee, Inc.

Written by science writer Elizabeth Ogg

Supervised by **RAYMOND KATZELL**, *Chairman*, and a committee of **STUART W. COOK**, **EDWARD GIRDEN**, **OTTO KLINEBERG**, **ROGER T. LENNON**, **HARRY SANDS**, **LAURANCE F. SHAPPER** and **RICHARD P. YOUTZ**.

INTRODUCTORY PSYCHOLOGY

by Robert S. Harper

This new text offers a systematic view of psychology in one semester. It is as useful to the liberal arts student as to the student who is planning to specialize in psychology. Free of terms that often hinder those who have had no previous training—the reader is allowed to study the *principles* of psychology without becoming entangled in over technical language.

A special feature of this new text is its wealth of incorporated readings from professional sources. These readings appear wherever elaboration seems conducive to more thorough understanding of basic concepts.

INTRODUCTORY PSYCHOLOGY develops a comprehensive discussion of five fundamental principles of psychology.

- point of view and method
- motivation
- perception
- thought
- learning

send for your examination copy

ALLYN and BACON College Division, 41 Mt. Vernon St., Boston 8, Mass.

HELP!

PLEASE include your city postal zone number in your address when you write to us about

- your current subscription
- renewal of your subscription
- ordering a new subscription
- questions concerning any of our journals

The Post Office Department has asked us to cooperate with them in effecting the most efficient, economical method of delivering your journals. We must include the *zone numbers* for each subscriber's address in zoned cities.

ALWAYS USE YOUR ZONE NUMBER!

American Psychological Association
1333 Sixteenth Street, N. W.
Washington 6, D. C.

THE BRITISH JOURNAL OF PSYCHOLOGY

Edited by JAMES DREVER

Vol. 48, Part 4 November, 1957 20s. net (or \$2.81 post free)

MAVIS PLENDERLEITH and LEO POSTMAN. Individual differences in intentional and incidental learning.

D. MARJORIE BINDON. Rubella deaf children: a Rorschach study employing Munroe inspection technique.

E. C. POULTON. Previous knowledge and memory.

JOHN COHEN, E. J. DEARNALEY and C. E. M. HANSEL. Measures of subjective probability.

ANN SHEDDEN McCOLSKEY. The qualitative investigation of intelligence.

IAN M. L. HUNTER. The solving of three-term series problems.

J. TIZARD and P. H. VENABLES. The influence of extraneous stimulation on the reaction time of schizophrenics.

LEON LITWINSKI. The boundaries between the person and the world: a note on the paper by Gardner Murphy.

PUBLICATIONS RECENTLY RECEIVED.

Vol. 49, Part 1 February, 1958 20s. net (or \$2.81 post free)

H. P. HILDEBRAND. A factorial study of introversion-extraversion.

P. L. BROADHURST. Determination of emotionality in the rat. II. Antecedent factors.

ROBERT T. GREEN. Surprise, isolation, and structural change as factors affecting recall of a temporal series.

L. S. PENROSE and R. PENROSE. Impossible objects: a special type of visual illusion.

MARY WICKHAM. The effects of the menstrual cycle on test performance.

N. O'CONNOR and G. S. CLARIDGE. A 'Crespi effect' in male imbeciles.

D. WALTON and T. L. BEGG. The effects of incentive on the performance of defective imbeciles.

P. L. BROADHURST. A 'Crespi effect' in the analysis of emotionality as a drive in rats.

M. D. ALLAN. A pattern recognition method of learning Morse code.

P. R. N. SUTTON. The development of independent muscular control of separate eyelids in two racial groups: European and Polynesian.

J. A. DEUTSCH. Shape recognition: a reply to Dodwell.

PUBLICATIONS RECENTLY RECEIVED.

OTHER PUBLICATIONS RECEIVED.

The subscription price per volume, payable in advance, is 60s. net
(or \$8.43 post free)

Subscriptions may be sent to any bookseller or to the

CAMBRIDGE UNIVERSITY PRESS

Bentley House, Euston Road, London, N. W. 1, England

Coming next month

- The new, revised edition of

with a new accompanying WORK-BOOK, containing problems, graded in difficulty, for each chapter in the text.

EDWARDS: Statistical Analysis

A masterpiece of clarity and condensation, the new edition of this fine general-purpose elementary text is both readable and understandable from beginning to end. Advance readers especially commend the good balance between correlational and inferential material; clear, accurate definitions; emphasis on *purpose* of calculations; excellent treatment of probability theory and sampling.

- The new, revised edition of
also available

A CASEBOOK by Prof. Harrell & J. T. Rusmore containing 12 situations for class analysis and 2 "role plays" for group training in problem solving.

HARRELL: Industrial Psychology

A thoroughly up-to-date, critical and well balanced presentation of the psychological principles and applications of human relations, individual differences and human engineering, covering all such topics as interviewing, personnel tests, training, safety, motivation, job satisfaction, etc.

- The new book of readings

SEIDMAN: The Child

65 articles, each an important original contribution to its subject, present vital ideas, authoritative analyses and significant data on all aspects of growth and development from many points of view.

for examination copies, write to

Rinehart & Company, Inc.



232 Madison Ave., New York 16, N. Y.

THE URGE TO MASS DESTRUCTION

A Well Documented Synthesis on the Vital Problem of Human Self- and Other Destruction, Embracing Practical Problems of Psychotherapy Together with Philosophical, Ethical and Social Facets

by SAMUEL J. WARNER, Ph.D.

*Psychotherapist, Bleuler Psychotherapy Center, New York; formerly
Chief Psychologist, Halloran Veterans Administration Hospital*

Critically Acclaimed by the Profession Throughout the World

"... an extremely keen analysis of this problem so vital for human existence . . ."—Julio Endara, M.D., *Archives of Criminology, Neuropsychiatry and Related Disciplines* (Ecuador), April-June, 1957

"... an interesting and absorbing work . . . pointing out several fascinating facets of the will to 'self- and other destruction' in the therapeutic situation and in this modern atomic world."—*Psychiatric Quarterly Supplement, Part I, 1957*

"Of special interest to the therapist is the author's discussion of a significant problem in therapy—that of the self-defeating patient."—Jules Barron, Ph.D., *Newsletter of the American Academy of Psychotherapists, June, 1957*

"This relationship that obtains in widely scattered areas invites the formulation of principles which may be applied to the threat of mass destruction on the larger social scale that threatens the world today."—Paul H. Hoch, M.D., and Nolan D. C. Lewis, M.D., "Review of *Psychiatric Progress*," *American Journal of Psychiatry, June, 1958*

"... a serious piece of work which raises serious questions . . . Dr. Warner is fully justified in uttering his warning against the tendency to prefer the alternative of power to that of love, and in using his study to underline that warning three times."—*The Plain View* (England), Winter, 1957

"The sections on vengeful, power-oriented, self- and other defeating patients . . . bring together widely scattered material of great relevance, and ought to be carefully read by psychotherapists. Particular note should be made of elements of psychotherapeutic technique recommended by Dr. Warner and of differences between the concepts of defeating and resistance. Recommended for subject collections."—*The Library Journal, June 1, 1957*

Order Now—On Approval

Please send, on approval: WARNER (\$3.50)

☐ Check enclosed

☐ Charge my account

Name.....

Address.....

HM-358



GRUNE & STRATTON, INC.

381 Fourth Avenue New York 16, N. Y.

**Human Engineer
RCA, Moorestown, N. J.
has an opening for an
Experimental Psychologist**

This assignment includes job analysis, equipment design, and human engineering consultation with engineers during electronic and electro-mechanical equipment and systems design.

Applicants should have: an M.A., Ph.D. or equivalent experience. Background in industrial or military engineering is desirable.

RCA in Moorestown offers: excellent professional working atmosphere, modern facilities in suburban Philadelphia; liberal employee benefits, and an attractive starting salary commensurate with qualifications.

Send Resume In Confidence To:

**Mr. D. D. Brown
Mgr., Engineering Employment
Radio Corporation of America
Moorestown, N. J.**



ERNEST R. HILGARD'S

INTRODUCTION TO PSYCHOLOGY 2nd Edition

"... an even better book than the excellent First Edition"; "... the best introductory psychology text available"; "... our staff were unanimous in praising the scholarship of the book and especially the inclusion of so much very recent material."

These statements are typical comments we have received from college instructors throughout the country who have examined the new Second Edition of Ernest R. Hilgard's *Introduction to Psychology*. Every chapter of this sound introduction to the principles and data of psychology reflects the outstanding authorship of a distinguished scholar and teacher. This is a text that is

scholarly, up to date, and pre-eminently readable.

A new program of supplementary aids has been prepared to accompany this thoroughly revised and completely redesigned text. The *Student Guide and Workbook*, containing a synopsis, a multiple-choice quiz, and a classroom or individual experiment for each chapter, was prepared under the author's direction by Richard C. Teevan and Earl L. Jandron, and the *Instructor's Manual* was prepared by William D. Wells. In addition to the manual, there is a yearly *Test Item File* of 460 multiple-choice questions.

653 pages

\$6.50



HARCOURT, BRACE AND COMPANY ❁ ❁ New York 17

CONTEMPORARY APPROACHES TO COGNITION

**A SYMPOSIUM HELD AT THE
UNIVERSITY OF COLORADO**

**CONTRIBUTORS—JEROME S. BRUNER,
EGON BRUNSWIK, LEON FESTINGER,
FRITZ HEIDER, KARL F. MUENZINGER,
CHARLES E. OSGOOD, DAVID RAPAPORT**

Work in cognition has received little professional attention in recent years, and it is the purpose of this book to stimulate research in the field through the presentation of the studies of six noted psychologists. Among the papers: Scope and Aspects of the Cognitive Problem; A Behavioristic Analysis of Perception and Language as Cognitive Phenomena; The Relation Between Behavior and Cognition; Trends in Cognitive Theory. Illustrated. \$4.00

MASTERY OF STRESS

**By DANIEL H. FUNKENSTEIN, M.D.,
STANLEY H. KING, Ph.D.,
MARGARET E. DROLETTE, M.P.H.**

Based on a series of experiments conducted on a group of Harvard students, this book is concerned with the way these students reacted to certain new and difficult stress-inducing situations. Each man's emotional and physiological reactions were studied, with emphasis placed on the acute emergency reaction and on the ability or failure to master stress over a period of time. The interesting results should aid significantly in the work of preventive psychiatry. \$6.00



Through your bookseller, or from

**HARVARD
UNIVERSITY PRESS**

79 Garden Street, Cambridge 38, Massachusetts

5 NEW BOOKS in this field

YOUR SPEECH REVEALS YOUR PERSONALITY

by Dominick A. Barbara, Jamaica, N. Y.

Stresses the theme that the function of speech is not only for verbal communication but is also an expression of the individual's relationships to himself, to others and in groups. Gives the psychiatrist, speech teacher, psychologist or social worker a **keener understanding of communicative behavior as it appears instantaneously in everyday and clinical situations.** As the therapist increases his own awareness of the importance of communicative material, he can then share more fruitfully and constructively in the therapeutic situation. Pub. '58, 144 pages, Cloth, \$5.50

THE CLINICAL APPLICATION OF PROJECTIVE DRAWINGS

by Emanuel F. Hammer, *Psychology Unit, N. Y. City Court of Special Sessions*

Compactly ties together the scattered field of projective drawings which, as a clinical tool, has rapidly assumed a position of prominence in the projective battery. Deals with projective drawings primarily from a **clinical viewpoint**, both as an economic diagnostic method in actual practice and as an adjunct to psychotherapy. Includes chapters prepared by leading workers in the field. Cites many case histories. Pub. '58, 688 pp., 360 il., Cloth, \$13.50

THE HANGOVER

by Benjamin Karpman, *St. Elizabeth's Hosp., Washington, D. C.*

A Critical Study of the Psychodynamics of Alcoholism. A frank and penetrating study of the lives of seven men and seven women alcoholics in which the "hangover" is shown to be symptomatic of the specific underlying personality disorders leading to alcoholism. Contributes to a new and deeper understanding of emotional and personality factors leading to alcoholism. "Dr. Karpman, in terse and often moving language, lifts the curtain on 'slices' in the lives of fourteen alcoholics, showing how their hangovers reflect their emotions and especially the ever-present, ever-recurring problem of guilt."—*Newsweek*. Pub. '57, 560 pp., 16 il., Cloth, \$9.50

*of special
interest to
you!*

THE DOOR OF SERENITY

by Ainslie Meares, Melbourne

A study in the therapeutic use of symbolic painting (with **25 illustrations in full color**). This distinguished psychiatrist describes his treatment of a schizophrenic patient and the paintings through which she tried to communicate with him. A warmly human book yet with real scientific value as a contribution to research in the therapy of schizophrenia. "The author has the capacity to carry the reader with him during the treatment and we are privileged to share some of his anxieties, satisfactions and delights."—from the preface by Dr. Eric Cunningham Dax. Pub. '58, 120 pp., 25 il.

THE INTROVERT . . . HIS SOCIAL ADJUSTMENT

by Ainslie Meares

Points the way to understanding of the introvert and his social adjustment. **Indicates how the assets of his personality can be developed.** Sounds the warning that some social reactions bring greater introversion and final schizophrenia. The type of book the physician will recommend when the relatives seek advice about the introvert in the family. Also valuable for the minister, guidance officer, social worker, the introvert himself and his family and friends. Written simply and expressively by the author of several books on psychiatry. Pub. '58, 144 pages.

CHARLES C THOMAS • PUBLISHER

301-327 East Lawrence Avenue
Springfield • Illinois

Psychology and Mental Health

A report of the Institute on Education and Training
for Psychological Contributions to Mental Health,
held at Stanford University in August, 1955.

Edited by CHARLES R. STROTHER

Topics discussed at the Institute:

Training Needs of Psychologists in Community Mental Health	Training for Therapy
Specialization in Training	Training for Research in the Mental Health Field
Practicum Training	Problems of Departmental Organization

Price: \$1.75

Order from

American Psychological Association, Inc.
1333 Sixteenth Street, N. W.
Washington 6, D. C.

For the Exceptional Child

THE TRAINING SCHOOL AT VINELAND, NEW JERSEY

**A non-profit school for the care, treatment and education
of the mentally retarded child. Established 1888.**

The Training School provides for the welfare of 500 retarded and slow-learning children with a competent staff of nearly 300. Boys and girls two years of age and up with a mental potential of six years are accepted. Individual medical, psychiatric, psychological, speech and academic programs enable each child to develop to his full capacity.

The children live in small groups in comfortable cottages. They enjoy warm, homelike surroundings. Academic and vocational classes are limited to 10 students. 24-hour medical and dental care is provided in the well-equipped 40-bed hospital. The beautiful 1600-acre estate is located near the seashore in the heart of southern New Jersey.

For information write: Registrar, Box P
THE TRAINING SCHOOL AT VINELAND, NEW JERSEY

HAPPINESS FIRST . . . ALL ELSE FOLLOWS

from
across the nation
comes applause for

PSYCHOLOGY

Third Edition

Norman L. Munn

"This brings the text completely up-to-date. It is an excellent job of keeping a top-flight book current."

Eugene Hartley
City College of the City of New York

"An excellent revision of an always good introductory text."

William Bendig
University of Pittsburgh

"The new edition of Munn's PSYCHOLOGY is a very satisfactory book. Its detailed summaries and glossary are especially helpful. It is certainly among the best when used as an introductory text for general psychology. The student manual should facilitate well organized study of the book."

David Shawver
Northern Illinois University

"A thorough revision of an already superior text. I like the reorganization of material. The new sequence seems much more logical to me."

Armin Grams
Wisconsin State College, LaCrosse

"Excellent material and should be of tremendous worth to the beginning student."

Arthur Lerner
Los Angeles City College

451 pages

1956

\$6.00

Student's Manual and Instructor's Manual are available.

HOUGHTON MIFFLIN COMPANY

Boston 7

New York 16

Chicago 16

Dallas 1

Palo Alto

The Important New

FIFTH EDITION of Floyd L. Ruch's

Psychology and Life

will be published this Spring

PSYCHOLOGY AND LIFE, Fifth Edition, will effectively introduce the beginning student to the facts, theories, discoveries, and controversies of modern psychology.

New material on group problems and processes, new illustrations, and revisions in light of current trends will be included.

Also available, to make PSYCHOLOGY AND LIFE a complete program, will be the Workbook, Teacher's Manual, and Library of Test Items.

640 pages \$6.50 list

SCOTT, FORESMAN AND COMPANY

Chicago Atlanta Dallas Palo Alto Fair Lawn, N.J.



Introduction to Methods in Experimental Psychology, 3rd Ed.

By **MILES A. TINKER** and **WALLACE A. RUSSELL**. A timely revision of an outstanding laboratory manual, designed as

a guide for a first course in experimental psychology. The material and content in this book is complete, requiring no supplementary text. *Just published.*

Current Studies in Psychology

By **F. JOSEPH McGUIGAN** and **ALLEN D. CALVIN**. In this book are presented 33 reports of significant psychological experimental studies, rewritten and simplified to make them interesting and readily under-

standable to the beginning student. The studies deal with aspects of learning, motivation, growth and development, personality, perception, and social psychology. *To be published in April.*

Verbal Behavior

By **B. F. SKINNER**. *Dr. Skinner's definitive work on verbal behavior.* Following the pattern of a functional analysis of behavior, this book offers a formulation of verbal behavior tied in with earlier and

current experimental analyses of behavior. Techniques employed by the speaker to evoke his own verbal behavior are treated in a general account of verbal thinking. 478 pages, \$5.50.

Reading Difficulties: Their Diagnosis & Correction

By **GUY L. BOND** and **MILES A. TINKER**. This new book discusses the various problems which arise from reading disability, describes how to diagnose reading difficulties in the formative stages, and

offers directions for correcting reading disability. Based on experimental findings and sound classroom procedures, this book includes a wealth of case histories and illustrative material. 486 pages, \$5.25

Handbook of Speech Pathology

Edited by **LEE EDWARD TRAVIS**. Twenty-seven authorities in the various areas of speech pathology, each writing on his own specialty, have treated the causes, nature, expressions, consequences and management of disturbances in verbal com-

munication. Primary emphasis is placed on an understanding of the person involved rather than the symptoms displayed. *Illustrations and diagrams, 1088 pages, \$12.00.*

Appleton-Century-Crofts, Inc.

35 WEST 32ND STREET, NEW YORK 1, NEW YORK

NEW Titles in the Van Nostrand SERIES IN PSYCHOLOGY



Under the general editorship of David C. McClelland, Professor in the Department of Social Relations of Harvard University, this series is designed to provide basic texts at every level in every major field of psychology, both for liberal arts students and for professional schools.

.....

READINGS IN PERCEPTION

Edited by David C. Beardslee, *Assistant Professor of Psychology, Wesleyan University*, and Michael Wertheimer, *Associate Professor of Psychology, University of Colorado*.

This new collection of readings brings together in a single volume the fundamental materials for an understanding of the psychology of perception. These reports of original studies, written by the investigators themselves, retain the excitement of first-hand research. They explore how we are aware of the world about us, what basic processes give us this knowledge, and how sensations are turned into organized, meaningful perceptions.

To make clear the extent of present knowledge and to point out the directions which further research must take, the editors choose from two sources: classical materials which are currently significant, and recent points of view. Several of the papers are newly translated into English. *Ready Spring 1958*

MOTIVES IN FANTASY, ACTION AND SOCIETY: A Method of Assessment and Study

Edited by John W. Atkinson, *Associate Professor of Psychology, University of Michigan*.

This integrated series of articles by forty-one contributors surveys a decade of systematic research into the direct influence of motivation on imaginative processes. It draws from psychoanalytic theory, field theory, learning theory, and the decision-making theory of economics in search of a valid method for measuring socially significant human motives.

Beginning with studies of hunger conducted in 1947, the book examines how the method of analysis has been refined over the years and extended to various kinds of motivation. The range of problems to which the method is here applied has no equal in the psychological literature on human motivation. *Ready Spring 1958*

BODY IMAGE AND PERSONALITY

By Seymour Fisher, *United States Public Health Career Research Investigator, formerly Research Psychologist, Houston V. A. Hospital, and Sidney E. Cleveland, Assistant Chief Psychologist, Houston V. A. Hospital*.

This pioneering study unfolds a fascinating array of cases dealing with a relatively unexplored question: how the individual organizes experiences having to do with his body, and how this mode of organization (which the authors call "body image") affects his behavior.

Specifically, the volume explores the degree of definiteness and strength the individual ascribes to the boundaries or border zones of his body. The authors describe an objective method for measuring this variable by special scoring of Rorschach tests, TAT and drawing techniques. They then develop and test a theory concerning the influence of body image characteristics on the individual's total adjustment. *Ready Spring 1958*

D. Van Nostrand Company, Inc.

120 ALEXANDER STREET, PRINCETON, N. J.

CONTEMPORARY PSYCHOLOGY

A Journal of Reviews

Edwin G. Boring, Editor

HAVE YOU READ THESE REVIEWS?

The Clinical Psychologist, by
W. A. HUNT

Reviewer: G. A. Kelly

Basic Psychology, by LEONARD
CARMICHAEL

Reviewer: C. T. Morgan

Sense and Nonsense in Psychology, by H. J. EYSENCK

Reviewer: Ruth S. Tolman

Theories of Personality, by
C. S. HALL and GARDNER LINDZEY

Reviewer: H. L. Ansbacher

School Problems in Human Relations, by LLOYD COOK and
ELAINE COOK

Reviewer: S. M. Corey

Subscription, \$8.00

Foreign, \$8.50

Single Copy

\$1.00

AMERICAN PSYCHOLOGICAL ASSOCIATION

Publications Office

1333 Sixteenth Street, N.W.

Washington 6, D.C.

Ronald Books

• *Psychotherapy and Culture Conflict*

By Georgene Seward, Ph.D., *University of Southern California*. Examining the psychodynamics peculiar to the members of seven U.S. subcultures, this book details the problems of minority groups. Suitable adaptations in therapeutic procedures are suggested. Reviews classical psychoanalysis with emphasis on cultural aspects. Each chapter concludes with a bibliography of research and clinical sources. Judd Marmor, M.D., has contributed four case studies from his psychoanalytic practice. 299 pp.

• *Interpersonal Diagnosis of Personality*

By Timothy Leary, Ph.D., *Kaiser Foundation Hospital*. This is the first book to develop an objective, multi-level system of personality diagnosis based on interpersonal and social behavior rather than symptomatic or pathological behavior. Presents a series of complex techniques for measuring interpersonal expressions at different levels of personality, an empirical method for applying the theory, and techniques in diagnosis and prognosis at the clinical level. "The work unquestionably represents a major advance in clinical diagnosis."—*Contemporary Psychology*. 120 illus., tables. 518 pp.

• *Energy and Structure in Psychoanalysis*

By Kenneth Mark Colby, M.D., *San Francisco Institute of Psychoanalysis*. Fusing sound professional knowledge with bold original thought, this book deals with pure theory rather than the therapeutic techniques of psychoanalysis. Dr. Colby derives a new construct of psychic energy and a new cyclic-circular model of psychic structure which organizes innate and experiential factors into a structural, functional whole. "...psychologists will feel at home with his style of thinking and his direct, objective approach to issues."—*Contemporary Psychology*. Illus.

• *The Aged In American Society*

By Joseph T. Drake, Ph.D., *Davidson College*. Just published! Treating the older person as a physical, psychological, and social entity rather than a social statistic, the author explains modern attitudes toward the aged in terms of our cultural heritage. Deals with adjustment problems of older workers and job seekers, and analyzes the sociocultural environment of the aged. Discusses the economic and financial status of the retired person and his dependents, and society's efforts to help him. "No book yet published deals with the subject as comprehensively.... A scholarly work... well written and readable."—Ernest W. Burgess, *University of Chicago*. 14 tables, 445 pp.

THE RONALD PRESS COMPANY
15 East 26th Street, New York 10

The Dryden Press

Roger W.
Heyns

• THE PSYCHOLOGY OF PERSONAL ADJUSTMENT

Adjustment is seen as a *learned set of responses to environment* in this new text for any second course in psychology concerned with normal personality, adjustment, and mental hygiene. The author uses findings in psychology, sociology, and related disciplines to help the student develop a "theory of personality" in terms of which he can operate. 548 pp. List \$4.90

Paul R.
Farnsworth

• THE SOCIAL PSYCHOLOGY OF MUSIC

For students of music or of psychology, Professor Farnsworth's new textbook is a comprehensive analysis of the phenomena of the area where music and psychology overlap. The author outlines major problems and offers tentative answers to long-standing questions in experimental aesthetics. 304 pp. List \$4.50

Ernest A.
Haggard

• INTRACLASS CORRELATION AND THE ANALYSIS OF VARIANCE

The only source of a thoroughly up-to-date, readable presentation of modern theory of analysis of variance models, this new work provides a general method for summarizing many types of data not adequately handled by procedures now in use. 192 pp. List \$3.25

Allan L.
Edwards

• THE SOCIAL DESIRABILITY VARIABLE IN PERSONALITY ASSESSMENT AND RESEARCH

This new monograph is a contribution toward the control and prediction of a subject's response in personality testing to what he feels is socially desirable. 122 pp. List \$2.75

Theodore
Newcomb

• PERSONALITY AND SOCIAL CHANGE

The first systematic follow-up study of individual attitudes toward public issues over a period of years, this recently reissued classic, "the first major panel study," investigates the impact of various factors (among them an educational setting) upon the attitudes of students. 225 pp. List \$3.25

Carter—
McGinnis

• EFFECTIVE READING FOR COLLEGE STUDENTS

Pretested with 3,600 students, this proven text equips the student with the techniques he needs in order to improve his reading. Further, he learns to set up his own plan for improvement and to practice on his reading assignments in any field. 354 pp. List \$3.60

110 West 57th St. • THE DRYDEN PRESS • New York 19, N. Y.

RESEARCHERS PLEASE NOTE THESE SERVICES

CORRELATION COEFFICIENTS:

CORRELATION COEFFICIENTS are computed from your data. Normal time for processing is 7 to 10 days. COMPLETE with correlation coefficients, standard deviations, means, Sum of X, Sum of X^2 , Sum of XY, and the Sum of YX (for verification), a listing of each case and each variable (for your permanent files), and, duplicates of all reports. NOTE: We can handle 2 to 300 or more variables, and up to 10,000 cases or more. Tell us your needs.

- ☐ Please provide me with a firm estimate on obtaining correlation coefficients (as above) on the basis of _____ cases, and _____ variables. There are _____ variables of 1 digit each; _____ of 2 digits; _____ of 3; and, _____ of 4 digits each.

PUBLICATIONS:

(A ten day money back guarantee applies for publications).

- ☐ METZGER'S TABLE OF 10,000 SQUARE ROOTS. Gives square roots up to 4 digits on the basis of the square roots arranged in consecutive order 1 to 10,000 and the numbers ranging from 1 to 100,000,000. Size is 8 1/2 by 11 inches, 24 pages, \$2.50.
- ☐ METZGER'S TABLE OF 45,000 PER CENTS. Gives percentages up to 100,000 $\frac{1}{100}$ on the basis of 1 to 300 lines (numerator) and 1 to 300 columns (denominator). Size 8 1/2 by 11 inches, 54 pages, \$4.00.
- ☐ METZGER'S TABLE OF 100,000 MEDIA PRICES. Is of value to advertising agencies when determining revenue on non-commissionable space and time. The table gives 17,64705 per cent of every cent from \$ 0.01 to \$ 1,000.01. (Five mills have been added to each price for the purpose of rounding to the next highest cent). Size 8 1/2 by 11 inches, 100 pages, \$10.00.
- ☐ HOW TO INTERPRET CORRELATION COEFFICIENTS. Is being prepared for publication. \$2.00.
- ☐ METZGER'S TABLE OF RANDOM NUMBERS. Is being prepared for publication. Will give statistical proof of randomness. Price to be given at time of publication. (Check box and you will be notified of publication).

OTHER SERVICES:

© 1958 RTB

DATA - A newsletter containing methods and techniques of handling research data. Your notes, letters, and replies provide the criteria of knowing what information is of value to you.

- ☐ Please place me on the free DATA mailing list.

METHODS - When you are contemplating a research study, you will find us ready to help you reduce your cost for statistics through the reduction of man-hours and machine-hours through efficient systems. Tell us your needs and let us consider your problem.

MISCELLANEOUS - I have need from time to time for the following . . .

- | | |
|---|---|
| <input type="checkbox"/> Questionnaire tabulation | <input type="checkbox"/> Item analysis |
| <input type="checkbox"/> Test construction | <input type="checkbox"/> Percentiles |
| <input type="checkbox"/> Frequency distributions | <input type="checkbox"/> Pattern analysis |
| <input type="checkbox"/> Variance | <input type="checkbox"/> Coding forms |
| <input type="checkbox"/> Key punching | <input type="checkbox"/> Calculating |
| <input type="checkbox"/> Other: _____ | <input type="checkbox"/> Tabulating |

----- CLIP ADVERTISEMENT AND MAIL TO -----

Research Tabulating Bureau POST OFFICE BOX 7 INDIANAPOLIS 6, INDIANA
DEPT. 436

Name _____ Title _____

Company _____

Type of Business _____

Street Address _____

City _____ Zone _____ State _____

PERSONAL ADJUSTMENT. An Approach Through the Study of Healthy Personality

By SIDNEY M. JOURARD, *University of Florida*. Written from a positive point of view, this unique book discusses the factors determining the healthy, adjusted personality. The author outlines each aspect of personality and compares the normal, unhealthy and healthy versions of the trait in question. The sections on expositions of interpersonal relations, love, the self-structure, and conscience are new to the field. 1958, 462 pages, \$5.50

THE PSYCHOLOGY OF RELIGION. An Introduction to Religious Experience and Behavior

By WALTER HOUSTON CLARK, *Hartford Seminary Foundation*. A general survey of the psychology of religion, this new work follows in the tradition of William James, J. B. Pratt, P. E. Johnson, and Gordon W. Allport. Conversion, mysticism, worship, prayer, religion and the abnormal, the psychotherapy of religion, and the social psychology of religion are some of the areas covered in this comprehensive book. Spring 1958

DIFFERENTIAL PSYCHOLOGY. Individual and Group Differences in Behavior. Third Edition

By ANNE ANASTASI, *Fordham University*. Thoroughly revised to include recent American and European research in biology, anthropology and sociology, the third edition of this authoritative book contains significant new material on such topics as intellectual functioning in maturity and old age, age differences in personality traits, the relation of perception to personality, the nature of creativity, and research on culture and personality in the study of national and ethnic groups. Spring 1958

INTRODUCTORY CLINICAL PSYCHOLOGY

By SOL L. GARFIELD, *University of Nebraska Medical School*. Stressing diagnosis, psychotherapy and research, this book presents a study of the development and current role of clinical psychology, both as a science and as a profession. 1957, 469 pages, \$6.00

THE PSYCHOLOGY OF ADOLESCENCE

By ARTHUR T. JERSILD, *Teachers College, Columbia University*. An illuminating account of adolescent life and growth, this volume focuses attention on the adolescent as a person and on his attempt to discover and accept himself. 1957, 438 pages, \$5.00

The Macmillan Company

60 FIFTH AVENUE, NEW YORK 11, N.Y.